

TABLE 2D Continued

Test organism	Endpoint	Compound (purity)	Dose LED/HID ^a	Evaluation ^b		
				Without S9	With S9	Reference
Mouse ip exposure (<i>in vivo</i>)	DNA adducts	Glyphosate (isopropylamine salt)	270 mg/kg	2	0	Peluso <i>et al.</i> (1998)
Mouse ip exposure (<i>in vivo</i>)	DNA adducts	Roundup (30.4% glyphosate isopropylamine salt; 15% surfactant)	400 mg/kg	1	0	Peluso <i>et al.</i> (1998)
Mouse ip exposure (<i>in vivo</i>) alkaline elution of extracted DNA	DNA single-strand breaks	Glyphosate (99.9%)	300 mg/kg	1	0	Bolognesi <i>et al.</i> (1997)
Mouse ip exposure (<i>in vivo</i>) alkaline elution of extracted DNA	DNA single-strand breaks	Roundup (glyphosate 30.4%; 15% surfactant)	270 mg/kg	1	0	Bolognesi <i>et al.</i> (1997)
<i>R. catesbeiana</i> (tadpole)	DNA single-strand breaks; Comet assay	Roundup (glyphosate 30.4%; 15% POEA)	6.75 mg/L	1		Clements <i>et al.</i> (1997)
Mouse ip exposure (<i>in vivo</i>)	8-OHdG	Glyphosate (99.9%)	300 mg/kg	6	0	Bolognesi <i>et al.</i> (1997)

^a Lowest effective dose/highest ineffective dose.

^b 1, positive; 2, negative; 0, not tested.

plate, both with and without metabolic activation (Stegeman and Li, 1990).

Thus, the report of Rank *et al.* (1993) that glyphosate produced an equivocal result for mutagenicity in one bacterial assay is not supported by the other data as shown in Table 2. In the report of Rank *et al.* (1993) the preponderance of the data shows clear evidence of toxicity but no dose response. A single dose exceeded the spontaneous frequency by twofold (without microsomal activation) in TA98. In TA100, a strain that detects base substitution mutations, a single dose also showed a mutational response, but only with S9. Data were pooled from two separate assays, but neither set taken alone satisfied the widely accepted criteria of a positive response (i.e., two consecutive doses to exceed twice the spontaneous frequency). In contrast, the Ames tests completed by Kier *et al.* (1997) at Monsanto using Roundup, Rodeo, and Direct formulations at doses in excess of those reported by Rank *et al.* (1993) were uniformly negative. The studies of Kier *et al.* (1997) were conducted with complete protocols to satisfy international regulatory guidelines for these assays. Accordingly, the findings of Rank *et al.* (1993) must be contrasted with the clear negative responses found by several other investigators. Whether their results were due to the effects of toxicity is uncertain, but the weight of evidence indicates their results represent a false positive result, which is known to occur sporadically

in this and other genotoxicity tests (Brusick *et al.*, 1998).

Other endpoints that detect mutation have been used with Roundup formulations. Differing results were reported for the effect of Roundup in the dominant lethal assay of *Drosophila melanogaster*. One assay carried out using exposure conditions routinely used for this type of study showed no effect of Roundup (Gopalan and Njagi, 1981). A second nonstandard exposure scheme that required chronic exposure (up to 4 days) of larvae until pupation did show a significant elevation of the frequency of sex-linked lethals in spermatocytes (Kale *et al.*, 1995). This was a nonstandard variation of the *Drosophila* sex-linked lethal assay in which every chemical tested was evaluated as positive. Some methodological concerns associated with this report include the authors' lack of experience with the assay, absence of negative controls, and high exposures that included treatment with chemical concentrations that were lethal to half the test population (LC₅₀). No firm conclusions can be made for possible mutagenic effects from Roundup exposure on the basis of these two studies that applied different methodologies.

Chromosomal Aberration Studies

Evaluating the potential for a chemical to cause structural chromosome aberrations provides relevant information for purposes of health risk assessment

since there is a clear association between chromosome rearrangements and cancer (Tucker and Preston, 1996). Virtually all tumors contain structural (and/or numerical) rearrangements (Rabbitts, 1994; Solomon *et al.*, 1991), although these most probably arise late in tumor development. Nevertheless, clear evidence for the production of chromosome abnormalities that are heritable at the cellular level is an important consideration for cancer hazard assessment. As discussed above, results of chronic exposure studies in rats and mice demonstrate that there is no evidence of tumorigenicity for glyphosate, an important fact that should be taken into consideration when evaluating all of the chromosomal aberration studies described below.

Glyphosate was negative in an *in vitro* mammalian cytogenetic assay using human lymphocytes with or without microsomal activation at concentrations up to 0.56 mg/mL and at exposures up to 48 h (van de Waart, 1995). These tests were performed according to OECD and EEC guidelines.

Lioi *et al.* (1998a,b), in contrast, have recently reported that glyphosate produced an increased frequency of chromatid breaks as well as other chromosomal aberrations in both cultured human and bovine lymphocytes. There is reason to question these positive results on several grounds. Lioi *et al.* (1998a) reported evidence of chromosomal damage at doses three orders of magnitude lower than the van de Waart (1995) study cited above. Although Lioi *et al.* (1998a) also found that under similar conditions, the fungicide vinclozolin produced similar types and frequencies of chromosomal damage across the same dose range as they reported for glyphosate, vinclozolin is known to produce toxicity by nongenotoxic mechanism(s). In other experiments reported previously by Hrelia *et al.* (1996), the fungicide failed to produce chromosomal aberrations at 70 times the dose applied by Lioi *et al.* (1998a) and failed to show other evidence of direct DNA damage in a number of tests. The treatment protocol of 72 h used by Lioi *et al.* (1998a) was also unusual compared with recognized methodologies. Chemicals that reliably produce chromosomal aberrations in stimulated lymphocytes can do so after a 4-h exposure and often after 20 h of exposure, the usual test intervals. The observation that glyphosate exposures resulted in a reduced growth rate (thus affecting time to first mitosis) is an indication of a toxic effect, and this can have clear implications for the evaluation of any chromosomal aberration data. For an accurate assessment of induced aberration frequency, the cytogenetic evaluations must be conducted in a period of time shortly after exposure (Tucker and Preston, 1996). The results with bovine and human lymphocytes were not consistent. Lioi *et al.* (1998a) found chromosome type breaks in human cells, but few if any with bovine cells (Lioi *et al.*, 1998b), without apparent explanation. Finally, the authors do not explain why under their test conditions

three different chemicals, atrazine, vinclozolin, and glyphosate, produced nearly identical responses over exactly the same dose ranges also in human lymphocytes. This is even more remarkable in view of the findings from other laboratories (Hrelia *et al.*, 1996; van de Waart, 1995) that observed no effects in either glyphosate or vinclozolin at dose levels in excess of 70 times those employed by Lioi *et al.* (1998a).

Glyphosate alone was not active for chromosomal damage (De Marco *et al.*, 1992; Rank *et al.*, 1993). Another study has reported that Roundup can produce chromosomal aberrations in onion root tip cells (Rank *et al.*, 1993). These investigators postulated that the toxic effect of the surfactant in Roundup could be responsible for the effects on the plant cell chromosomes. Goltenboth (1977) found that glyphosate had an effect on water hyacinth root tips and concluded that the dose-dependent effect on the formation of mitotic figures at prolonged exposure times was due to an effect on the spindle apparatus, leading to disorganized chromosomes at anaphase. Given the herbicidal activity of glyphosate, these results are considered secondary to plant toxicity and not relevant to human health.

Of greater relevance than *in vitro* effects is evidence of *in vivo* effects. In this regard, administration of glyphosate to rats did not produce an increase in frequency of chromosomal aberrations (Li and Long, 1988). No effects were observed in rat bone marrow at several time periods posttreatment following intraperitoneal administration of 1.0 g/kg glyphosate.

The *in Vivo* Micronucleus Assay

A number of studies have used the mouse bone marrow micronucleus assay to examine the effects of exposures to glyphosate and Roundup on dividing red blood cells (Table 2). The micronucleus assay targets the most actively dividing cell population of the bone marrow, the polychromatic erythrocytes (PCEs). PCEs represent immature cells in the progression of hematopoiesis to normochromatic erythrocytes (NCEs) found in peripheral blood. The toxic effect of a chemical exposure to bone marrow can be assessed by the ratio of PCE/NCE. Different mechanisms may be involved in the evolution of micronuclei, including chromosome breakage (clastogenesis) or effects on spindle organization (aneuploidogenesis). Almost all the results for either glyphosate or Roundup expressed as micronucleated PCE (MN-PCE) per 1000 PCE fall within the range of control (vehicle) values. The frequency of spontaneously (vehicle) produced micronuclei in newly produced polychromatic erythrocytes was within the historical range for the CD-1 strain of mouse (Salamone and Mavournin, 1994).

All but one of the published or unpublished procedures that have examined the effect of glyphosate or Roundup on the bone marrow have used intraperito-

neal (ip) injection as the route of exposure. While less relevant for purposes of assessing risks for human exposure, ip injection assures high distribution of chemical into the circulatory system of the test species and exposure of target cells in bone marrow with maximum potential for observation of genotoxic events. In the only study done using the more relevant oral route of exposure (NTP, 1992), glyphosate did not produce micronuclei following 13 weeks of dietary administration to B6C3F1 at dosage levels up to 50,000 ppm (11,379 mg/kg body wt/day).

Three studies (Kier *et al.*, 1997) examined the different herbicide formulations containing glyphosate. Rodeo herbicide contains only glyphosate as the IPA salt, while Roundup and Direct are formulations that also contain surfactant systems. These bone marrow micronucleus studies were performed according to accepted EC/OECD guidelines, using ip injection as the route of exposure in CD-1 mice. OECD (1998) guidelines require exposed and control animals (6 per sex at each dosage and for each time period of exposure) for dosages examined. At least 1000 PCEs per animal were scored for the incidence of MNPCs. In each case, Kier *et al.* (1997) found no evidence of clastogenic effect of the herbicide formulation as measured by an increase in the frequency of PCE-containing micronuclei.

Since Rodeo contains no surfactant, it is therefore less acutely toxic and could be tested at higher dose levels than the other two formulations containing surfactants. The LD₅₀ for ip exposures to Rodeo was calculated to be 4239 mg/kg in CD-1 mice during range-finding experiments. Rodeo exposures for bone marrow micronucleus assays included doses of 3400, 1700, or 850 mg/kg. There was no evidence of micronucleus induction in either males or females at any dose or time point tested, including up to 72 h posttreatment (Kier *et al.*, 1997).

For Roundup, ip exposures in CD-1 mice were up to 86% of the LD₅₀ (643 mg/kg), and bone marrow samples were prepared at 24, 48, and 72 h posttreatment were negative for micronucleus induction (Kier *et al.*, 1997). Roundup exposures at all doses tested up to 555 mg/kg (single dose, ip) failed to produce a significant increased number of MNPCs per 1000 PCE in bone marrow of exposed mice.

A third herbicide formulation using glyphosate and a surfactant was tested in the bone marrow micronucleus assay using CD-1 mice (data not shown in Table 2). The herbicide Direct contains tallow amine surfactant with a longer carbon chain length than POEA, the surfactant used in Roundup. Male and female CD-1 mice were given single ip injections of Direct at three doses; the highest exceeded 80% of the LD₅₀ (436 mg/kg). The doses were 365, 183, and 91 mg/kg of formulation. Bone marrow samples evaluated at 24, 48, and 72 h postexposure were negative for micronucleus induction (Kier *et al.*, 1997). Direct exposures at all doses

tested up to 365 mg/kg (single dose, ip) failed to produce any increase in the number of MNPCs per 1000 PCE in bone marrow of exposed mice when compared to control mice that received saline.

Bolognesi *et al.* (1997) reported that glyphosate and Roundup were weakly positive in the bone marrow micronucleus assay in Swiss/CD-1 mice (Table 2). Roundup (ip) reduced the frequency of PCEs in male mice compared to controls, suggesting some evidence of systemic toxicity. The results of Bolognesi *et al.* (1997) contrast with those of Kier *et al.* (1997) that reported no increased micronucleus formation (even at much higher doses than Bolognesi *et al.* tested). Kier *et al.* (1997) did not see a change in total PCE/NCE ratio among females, but only at the highest dose (3400 mg/kg) when the IPA salt of glyphosate (Rodeo) was used. The protocol used by Bolognesi *et al.* (1997), however, varied from the standard acute bone marrow micronucleus assay and only three or four animals per dose group were used. Two ip injections, each representing half the total dose, were administered 24 h apart. Animals were sacrificed at either 6 or 24 h after the total dose (approximately 48 h after initial exposure). The results reported by Bolognesi *et al.* (1997) are at direct variance with those observed in much larger studies carried out under conditions of accepted GLP. First, they report a significant toxic effect on the bone marrow from exposure to glyphosate compared to controls. The number of PCEs usually decrease with toxicity. The ratio of PCEs to NCEs was 73% in controls, but was reduced to 50% with glyphosate and 30% with Roundup. This frequency of PCE production in control animals is unusual for the Swiss CD-1 mouse (Crebelli *et al.*, 1999) and could be indicative of an elevated level of spontaneous micronucleus production. Kier *et al.* (1997) found that approximate ratios for PCE/NCE were similar for control and treated animals, and this is the general experience for results of a well-conducted test (OECD, 1998). Bolognesi *et al.* (1997) compensated for the use of fewer animals by increasing the total number of cells examined per animal. Thus, Bolognesi *et al.* (1997) relied on counts from 3000 PCEs examined per animal in fewer animals to calculate the frequency of micronuclei per 1000 PCEs in pooled data. This may have skewed results, for example, because one outlier animal would be disproportionately represented. The accepted methodology includes counting PCEs for 600 animals and requiring increases in at least two. Bolognesi *et al.* (1997) did not provide micronucleus data for individual animals, contrary to customary practice, and presented only summary totals, pooled for all animals.

Rank *et al.* (1993) observed no evidence of significant induction of chromosomal effects in NMRI-Born mice exposed to either glyphosate or Roundup using ip injection. These two materials were administered to male and female mice (6 per sex at each dose) at dose

levels up to 200 mg/kg body wt. Bone marrow was examined 24 and 48 h after exposure, and cells were scored for NCEs and PCEs as well as for the frequency of MNPCs. The weighted mean for spontaneous MN/1000 PCE in this strain is 2.06 (range 0.4 to 7.0) (Salamone and Mavourin, 1994). For glyphosate, there was no evidence of increased frequency of micronuclei in the bone marrow and no change in the relative frequency of PCE/NCE. This result is in general agreement with Kier *et al.* (1997).

In summary, there are a large number of *in vivo* bone marrow micronucleus tests that depend on ip exposure to (1) the herbicide Roundup; (2) its active ingredient glyphosate; or (3) the more soluble form of glyphosate as the IPAsalt. These exposures range up to 80% of the LD₅₀ in mice, but have failed to show significant genotoxic effects on replicating bone marrow cells. The bone marrow micronucleus assay is a simple yet reliable method capable of providing evidence for *in vivo* genotoxicity resulting from different mechanisms (Crebelli *et al.*, 1999). The conclusion that must be made from this information is that there are no genotoxic events that occur *in vivo* in the absence of overt bone marrow toxicity. This fact is important in the evaluation of the results of other *in vivo* and *in vitro* results.

***In Vitro* Sister Chromatid Exchange**

Analysis of sister chromatid exchange (SCE) frequency can be an unreliable indicator of genotoxic effect. The frequency of SCE can fluctuate based on osmotic balance. Sodium and potassium chloride concentrations have been implicated in SCE production (Galloway *et al.*, 1987). While somewhat more sensitive than assays of clastogenic activity or chromosomal aberrations, the SCE assay does not indicate a mutagenic effect. Therefore, it is not appropriate to suggest that increases in SCE could be indicative of cancer risk, primarily because of the lack of an associated cellular outcome (Tucker and Preston, 1996). The utility of the *in vitro* SCE assay is questionable, because hazard can be more readily assessed using any number of *in vitro* assays specific for mutation. The SCE assay monitors direct exchange between sister chromatids that suggest recombination. SCE are a cytogenetic manifestation of interchanges between DNA replication products at apparently homologous loci. The exact nature of these exchanges and their relevance to toxic or genetic endpoints are matters of some debate (Tennant *et al.*, 1987; Zeiger *et al.*, 1990). The mechanism of SCE formation has not been established, but it has been suggested that they may involve events closely associated with replication (Tucker and Preston, 1996). Several studies have examined the effects of glyphosate and Roundup on the frequency of SCE in cultured human or animal lymphocytes (Table 2).

Vigfusson and Vyse (1980) were the first to report on

the frequency of SCE in human lymphocyte cultures exposed to Roundup. The authors acknowledged that cytotoxicity was a confounding factor for their results. They observed very minor changes in SCE in lymphocytes from two donors, but only two doses were reported because the highest dose was toxic and no cell growth occurred. Cells from one donor appeared to show a moderate response, but the other did not. Therefore, the results are not internally consistent. Because of this lack of dose response, it is not possible to apply statistical analysis to determine whether or not an observable effect could be described.

Bolognesi *et al.* (1997) reported SCE in cultured human lymphocytes after exposure to glyphosate (1.0 to 6.0 mg/mL) or Roundup (0.1 mg/mL). Glyphosate as the free acid is soluble in this range and has a pH of 2.5. The investigators provided no indication of any precautions taken to ensure against the strong acidity of glyphosate in solution. Glyphosate produced a weak response of about three SCE per cell (estimated from the figure presented) after a 48-h exposure. These results were produced from two donors whose data were pooled (50 metaphases per exposure concentration). Normally, protocols for analysis of cytogenetic data would not permit pooling of data from different individuals or from different experiments. Confidence in results and statistical analysis are only valid when expressed on the basis of the variation of response among the individuals tested. Bolognesi *et al.* (1997) failed to provide the tabulated SCE values for individuals or experiments, so it is quite possible that the variation within the data set explains the apparent increase. According to Bolognesi *et al.* (1997) Roundup was more toxic to lymphocytes, and only doses approximately 10-fold below those tolerated for glyphosate could be tested. Once again, the responses described by these authors are well within the spontaneous SCE frequencies in the human population (see discussion above).

Lioi *et al.* (1998b) reported increases in SCE per cell for bovine lymphocytes exposed to several low doses of glyphosate (up to 29 mg/L). However, changes were not related to exposure over a greater than 10-fold range of dose. Similarly, Lioi *et al.* (1998a) failed to detect a dose response for SCE production in human lymphocytes after exposure to glyphosate. In addition, all of the SCE data reported by Lioi *et al.* (1998a) using either human or bovine lymphocytes were characterized by an extremely low frequency of spontaneous (background) events (e.g., ranging between 1.9 and 2.2 in the human lymphocyte study). More normal values for base SCE frequencies in human lymphocytes range around six per cell. Various values based on data from larger populations have been recorded by Anderson *et al.* (1991) (6.6/cell), Bender *et al.* (1989) (8.0/cell), and the Nordic Study Group (1990) (5±14/cell). This suggests that Lioi *et al.* (1998a,b) could have performed the test

without sufficient scoring experience or that they saw no statistically significant change at any dose.

***In Vivo* Mutation**

In vivo, glyphosate has been shown to be devoid of genotoxic activity in a dominant lethal assay in mice (Wrenn, 1980). This result confirms that there is no reason to suspect that glyphosate could act to effect genetic changes in actively dividing reproductive tissues.

Mutation Studies with AMPA

The available data on AMPA indicate it to be non-genotoxic and nonmutagenic. No mutagenic activity was observed in a *S. typhimurium* mutation test performed on AMPA at concentrations of up to 5000 mg/plate, both with and without an exogenous source of metabolic activation (Shirasu *et al.*, 1980). Similarly, no genotoxic effects were observed in an *in vitro* unscheduled DNA synthesis repair in rat hepatocytes exposed to AMPA at concentrations of up to 5000 mg/mL (Bakke, 1991). *In vivo*, no evidence of micronuclei induction or other chromosomal effects was found in the bone marrow of CD-1 mice treated with AMPA by ip injection at doses of 100 to 1000 mg/kg body wt (Kier and Stegeman, 1993). The results support the weight-of-evidence conclusion that AMPA is nongenotoxic.

DNA-Reactive Species from Glyphosate or Roundup

Glyphosate is not a DNA-reactive chemical. Experiments *in vivo* were carried out in which Swiss CD-1 mice treated by ip administration of glyphosate as the isopropylammonium salt at perilethal doses of 130 and 270 mg/kg (Peluso *et al.*, 1998). Glyphosate administered ip is considerably more toxic than either dermal exposure or by ingestion, and the doses utilized by Peluso *et al.* (1998) should be considered extraordinary. No evidence of DNA adducts was found on examination of kidney and liver from these mice as measured by the ³²P postlabeling procedure. The route of administration should be considered unusual, since ip injection is a route of exposure of little relevance for humans. In mice, the LD₅₀ values are 134 to 545 mg/kg body wt (WHO, 1994a).

When CD-1 mice were exposed ip with a formulation identified as Roundup (600 mg/kg of a 30.4% IPA salt or a dose equivalent to 182 mg/kg body wt) which contained a surfactant, Peluso *et al.* (1998) reported what they described as evidence for DNA adducts by the ³²P postlabeling procedure in tissues isolated after exposure. There are a number of problems with the procedure that led to this conclusion. First, there is no evidence for a dose response over the narrow range of doses examined. Second, the level of adducts reported

is so low that it is well within the range reported for normal endogenous adducts (Gupta and Spencer-Beach, 1996). In addition, it was not determined if the adducts were derived from the formulation ingredients. There is no evidence that direct DNA-reactive intermediates are produced by the surfactants commonly utilized in field formulations of Roundup. The solvent system used to resolve the potential adducts was suitable for the characterization of large, bulky nonpolar polycyclic aromatic hydrocarbon-type nucleotide adducts (Randerath *et al.*, 1984), which are unlike adducts that would be generated from molecules like glyphosate or the surfactant. The poorly resolved adduct spots of the type reported by Peluso *et al.* (1998) are commonly observed in tissues from animals exposed to complex environmental mixtures. In general, exposures to a limited number of chemical components (as might be expected in Roundup) produce well-defined radioactive products on chromatography, unlike the diffuse zones reported. All these considerations suggest that the chromatographic alterations may have been derived from sources other than the formulation ingredients (i.e., naturally occurring molecules or endogenous metabolites). Indeed, Peluso *et al.* (1998) were unable to provide any chemical characterization of the product(s) that they identified as adducts, and it should be concluded that the observations of Peluso *et al.* (1998) are not supportive of a biologically relevant response.

Others have reported that ip injection of Swiss CD-1 mice with glyphosate and Roundup could result in an increased incidence of alkali labile sites in DNA in kidney and liver (Bolognesi *et al.*, 1997). Alkali labile sites are generally produced at abasic sites in DNA and may be revealed under conditions that denature DNA secondary structure. The type of assay used by Bolognesi *et al.* (1997) could not differentiate between true abasic sites such as are generated by DNA lyase enzymes, sites produced by excision repair, or natural interruptions in DNA found at points of arrested DNA replication. The effects reported by Bolognesi *et al.* (1997) were observed at 300 mg/kg glyphosate or 900 mg/kg Roundup (this corresponds to 270 mg/kg glyphosate), which are doses close to or in excess of the LD₅₀ for mice (WHO, 1994a). DNA breaks could be detected at a brief time after initial exposure, but at 24 h of exposure, there was no evidence of an excess number of alkali labile sites. There are several reasons to question the interpretation of the results from this assay. These include the interpretation of evidence for an increase in single-strand or alkali labile sites. Such breaks might indicate, but could not differentiate between, events due to the increased number of cells arrested in S phase rather than an increase in the number of excision sites. Cytotoxic effects can also be responsible for introduction of single-strand breaks.

Bolognesi *et al.* (1997) reported a dramatic increase

in the number of oxidized guanine, 8-hydroxyguanine (8-OHdG), residues in DNA of liver cells from mice treated with glyphosate, but not Roundup. Opposite results were found for exposures to kidney cells that appeared to accumulate oxidative damage after treatment with Roundup, but not glyphosate. Products of reactive oxygen species, including 8-OHdG, are stable and tend to form adducts with protein and crosslink DNA at lower frequency (Randerath *et al.*, 1997a,b). The findings in the reports of Bolognesi *et al.* (1997) or Peluso *et al.* (1998) are not consistent with a specific mode of action. Increased levels of 8-OHdG residues is not by definition an indicator of chemical-DNA interaction. These products result from secondary effects associated with chemical induction or inhibition of repair of spontaneous lesions due to toxicity. The solvent system utilized by Peluso *et al.* (1998) could not detect oxidation products in DNA (Randerath *et al.*, 1997a). Metabolism studies in rodents have shown that glyphosate is poorly metabolized; therefore, it is unlikely that products of oxidation could be produced directly in the tissues identified as a result of glyphosate exposure as suggested by Bolognesi *et al.* (1997). It could be that toxicity produces reduced repair of spontaneous 8-OHdG that would then lead to an accumulation of oxidation products. Finally, the lack of increased 8-OHdG in the same organs with both glyphosate and Roundup containing the equivalent amount of glyphosate suggests that glyphosate is not causing the change observed.

Other assays have been used to indirectly demonstrate the possibility of formation of DNA-reactive species from exposure to Roundup. Direct reaction with purine or pyrimidine nucleotides could lead to elimination of an altered base on exposure to alkali. Alkali-sensitive sites resulting from depurination or depyrimidation events can be detected in the Comet assay, a methodology to demonstrate DNA strand breaks. Clements *et al.* (1997) used the Comet assay to examine DNA in erythrocytes from tadpoles exposed to various herbicides including Roundup. Clements *et al.* (1997) reported evidence of a treatment-related increase in DNA breaks as measured by migration of DNA from the bulk of nuclear material in an electrophoretic field. Tadpole erythrocytes were unaffected at the lowest concentration of Roundup diluted in water (1.7 mg/mL), but at greater concentrations (6.75 or 27 mg/mL) did produce evidence of single-strand breaks (SSB) in alkaline Comet assays. The dose of Roundup formulation used in these assays was considerably greater than would be expected at environmental concentrations. Tadpoles were bathed in the exposure concentrations for a period of 24 h prior to testing. Other tests have clearly shown that glyphosate does not interact with DNA directly, so the effects observed may be from secondary effects of cytotoxicity. Although efforts were taken (trypan blue exclusion) to select cells

not undergoing necrosis or autodigestion of DNA, cytotoxicity may have been unavoidable at the doses utilized in the assay.

Rat primary hepatocyte cultures showed no evidence of an increase in unscheduled DNA synthesis (UDS) after a wide range of exposures to glyphosate *in vitro*. Doses examined ranged over 3 orders of magnitude but failed to produce evidence of DNA repair (Li and Long, 1988). These observations in a well-characterized and sensitive system indicate an absence of DNA reactivity, either direct or following hepatocellular biotransformation (Williams *et al.*, 1989).

Evaluating Genotoxicity Data: Weight-of-Evidence Approach

When evaluating data for genotoxicity, a primary goal is to determine (a) the likelihood of occurrence of a key event; and (b) whether that event might lead to heritable changes associated any adverse effect *in vivo*, including cancer. The basis upon which a weight-of-evidence evaluation can be constructed include the following:

- A statistically significant observation should be reproducible and biologically significant.
- A dose-response relationship should exist for effects.
- The effects should be permanent and progressive, as opposed to reversing upon cessation of chemical dosing.
- The nature of DNA effects should be characterized.
- The database should be consistent or inconsistencies adequately explained.
- The effects produced in the assay should be relevant to humans.

A central objective of the weight-of-evidence is to avoid a situation that could permit one experimental test result to be accorded greater weight over others. A conceptual approach to the relative weighting of genotoxicity testing data in the final assessment of mutagenic or carcinogenic potential is shown in Fig. 3. This model is based on the National Research Council guidance to evaluating sources of data for risk evaluation (NRC, 1983) and is similar to procedures recommended by several regulatory agencies (e.g., U.S. EPA, 1996b, ^a Proposed Guidelines for Carcinogen Risk Assessment⁹) for mutagenicity risk assessment.

The key features of the weight-of-evidence scheme described in Fig. 3 are its ability to accommodate results from multiple testing protocols and its requirement to place a premium on consistency and coherence of results. Greater weight is given to results from laboratories using accepted, well-validated protocols employing GLP procedures. The scheme can also function as a tool for analysis of a specific protocol, evaluating internal consistency of results from testing for similar

Guidance for preparing a Weight-of-Evidence analysis for mutagenicity data for a chemical.

Elements of Analysis

LOW WEIGHTING

HIGH WEIGHTING

Assay System Validation

Weak —————> Strong

Reproducibility /Consistency of Data

Variable —————> Consistent

Endpoint measured

Indirect/DNA damage —————> Heritable Mutation

Species/metabolism

In vitro/eucaryote —————> *In vivo* mammal

Magnitude of Effect/Dose Level

Weak/Toxic dose —————> Strong/Nontoxic dose

FIG. 3. Weight-of-evidence data hierarchy organization for evaluation and preparation of a statement of the potential for mutagenic activity of a compound.

endpoints. On the other hand, a result from a novel procedure might be acceptable because it is deemed to provide important evidence of a chemical mode of action.

The weight-of-evidence analysis is also significantly affected by the relevance of the data available. Short-term assays disclose evidence of genotoxic events *in vitro* or *in vivo* that can be compared to more comprehensive examinations of animals such as by the 2-year rodent cancer bioassay. For purposes of human hazard assessment, greater confidence should be placed in those test systems that examine possible genetic effects from chemical exposure of animals than in tests that rely on selected homogeneous cell populations raised and tested *in vitro*. Chemical exposures of biological systems carried out *in vitro* are much less realistic, and results of such tests can be determined by the effects of toxicity. Such toxicity can occur at unusually high exposure concentrations and/or be dependent on metabolic and detoxication capabilities. Finally, a weight-of-evidence evaluation seeks to establish a dose-response relationship. Greater attention should be given wherever there is a clear association between increased exposure and a genetic effect.

Weight-of-Evidence Narrative

The database for genetic effects of glyphosate and Roundup is both large and heterogeneous. Such extensive data sets are sometimes problematic to interpret,

but this is not the case for glyphosate. Sporadic positive responses (i.e., nonreproducing) are inherent within assays used to detect mutagenicity or genetic alterations, particularly *in vitro* tests (Brusick *et al.*, 1998; Kirkland and Dean, 1994). Scientific objectivity precludes emphasis on a few of positive responses rather than the overall response pattern and trend of the results.

Many testing schemes for mutagenicity and other short-term assays are conducted using acute exposure protocols designed for purposes of cancer hazard identification. In the case of glyphosate, there are no tumorigenic endpoints in rodents, or other animals that have been tested, and hence there is no cancer hazard to attribute to any genotoxicity finding.

The information in Table 2 clearly shows that in diverse test systems, glyphosate alone, or as a formulation in Roundup fails to produce any evidence for mutation induction. Effects of glyphosate on chromosomal organization *in vivo* have been almost wholly negative. The micronucleus data (Table 2) and those for chromosomal effects in bone marrow (Li and Long, 1988) are consistently negative except for the micronucleus data from Bolognesi *et al.* (1997), which must be viewed with reservation until a more complete description of the data is available. The remainder of animal studies carried out *in vivo* show no effect of either glyphosate or Roundup. On the other hand, the results of *in vitro* chromosomal aberration tests are more mixed. For reasons described above, it is difficult to give equal weight to the studies based on the quality of the study data presented. In particular, the two studies on bovine and human lymphocytes presented by Lioi *et al.* (1998a,b) are inadequate and, as described, have many problems relating to the internal consistency of the data for other pesticides tested. Accordingly, these studies are not weighted equally with the assay carried out under GLP conditions (van de Waart, 1995).

There is evidence for the production of effects such as single-strand breaks in DNA, but none of these have been linked to the presence of identifiable adducts and are therefore most likely due to secondary effects of toxicity. Metabolic studies in rodents plainly show that greater than 99% of glyphosate is rapidly excreted unchanged, and there is very little evidence that chemical residues are associated with any tissue. Bolognesi *et al.* (1997) have reported evidence of accumulation of 8-OHdG adducts in livers of mice treated with glyphosate ip, but this cannot be reconciled with the fact that glyphosate is not metabolized. There has been absolutely no evidence produced to date that shows glyphosate or Roundup is directly responsible for these events. It may be that the injection of such a large quantity of glyphosate (2.3–150 mg) creates stress-related events that lead to accumulation of these oxidative adducts, which do occur spontaneously. Similarly, the apparent production of single-strand breaks

in liver or renal tissue DNA (Bolognesi *et al.*, 1997; Peluso *et al.*, 1998) after alkaline elution experiments could also be indicative of events of cytotoxicity that reduces or retards rates of DNA replication, giving the appearance of breakage events. The fact that these events were transitory, being no longer evident 24 h after exposure also suggests an indirect effect of exposure. Also, the negative UDS assay in hepatocytes (Li and Long, 1988) would tend to confirm that the SSB of Bolognesi *et al.* (1997) likely occur in S phase. Finally, Clements *et al.* (1997) also appear to have found a weak effect of Roundup on integrity of tadpole erythrocyte DNA in the Comet assay. Once again, the nature of the exposure conditions and the concentrations used were considerably greater than might be expected from environmental exposures. Peluso *et al.* (1998) could detect no evidence of DNA adducts or covalently bound residues in DNA from tissues of mice exposed to glyphosate alone. The weak production of SSB shown by alkaline elution and by the alkaline Comet assay (Clements *et al.*, 1997; Bolognesi *et al.*, 1997; Peluso *et al.*, 1998) are all suggestive of secondary effects of glyphosate exposure and probably arise from cytotoxicity rather than any direct effect of exposure.

The data relating to SCE production presented by Lioi *et al.* (1998a,b) and Bolognesi *et al.* (1997) are questionable on both methodological and scientific grounds. The spontaneous frequency of SCE in untreated cells was extremely low compared with the norm for human lymphocytes, the number of individuals whose lymphocytes were examined does not meet any standard for determining statistical significance, and the size of the increases observed was variable and not always dose related. Finally, the levels observed were well within the accepted variation for the incidence of SCE in the human population.

It is concluded that on a weight-of-evidence analysis of the data for glyphosate and for Roundup that they are neither mutagenic nor genotoxic as a consequence of a direct chemical reaction with DNA. The assay systems used in short-term genotoxicity tests are extremely sensitive, but no single test is sufficient to form the basis for conclusive proof of evidence of a genotoxic effect. In the case of these compounds, there is evidence that in circumstances that lead to cytotoxicity (i.e., high-dose experimental conditions), as would be predicted for any chemical that undergoes such testing, some effect may be observed such as the production of single-strand breaks. The balance of the credible data from *in vitro* and *in vivo* test results confirm the safety of glyphosate and Roundup as nongenotoxic and conforms to the fact that glyphosate is noncarcinogenic.

Summary

The potential genotoxicity of glyphosate has been tested in a wide variety of *in vitro* and *in vivo*

assays. No genotoxic activity was observed in standard assays conducted according to international guidelines. These assays include the *S. typhimurium* (Ames assay) and *E. coli* WP-2 reversion assays, recombination (rec-assay) with *Bacillus subtilis*, Chinese hamster ovary cell gene mutation assay, hepatocyte primary culture/DNA repair assay, and *in vivo* mouse bone marrow micronucleus and rat bone marrow cytogenetics assays. Recently, investigators have reported evidence of genotoxic effects in a limited number of studies. However, these assays used toxic dose levels, irrelevant endpoints/test systems, and/or deficient testing methodology. In view of the clear negative responses in relevant, well-validated assays conducted under accepted conditions, it is concluded that glyphosate is neither mutagenic nor clastogenic. On the basis of this evaluation, glyphosate does not pose a risk for production of heritable or somatic mutations in humans.

The mutagenic potential of Roundup herbicide and the POEA surfactant has been evaluated in several bacterial mutagenicity assays. While a marginal response was reported in one limited investigation, results from other complete, replicated studies conducted according to international guidelines and Good Laboratory Practices show that these materials are not mutagenic. Glyphosate herbicide formulations and the POEA surfactant have been evaluated for the ability to produce chromosomal aberrations in several mouse micronucleus assays as well as investigations with onion root tip cells and *Drosophila*. It is concluded that these materials were not mutagenic in mice. Results from the nonmammalian assays were confounded by various factors and provided no biologically relevant evidence of genotoxicity. DNA interaction studies with Roundup herbicide have been reported in the literature. While some of these studies reported positive effects, methodological limitations render the data scientifically uninterpretable and unacceptable for safety assessment. For example, the positive "effects" were observed only at cytotoxic concentrations *in vitro* and at perilethal doses *in vivo* administered by an irrelevant route of exposure (i.e., ip injections). Thus, the changes occurred only under extreme conditions of exposure in assays that do not directly assess mutagenicity and are known to produce effects that are secondary to toxicity. It is believed that the high, unrealistic dose levels used in these studies were sufficiently toxic to produce secondary effects rather than direct genotoxicity. In view of all this information, Roundup is not considered to be mutagenic under conditions that are relevant to animals or humans.

EVALUATION OF POTENTIAL SPECIFIC ORGAN/SYSTEM EFFECTS

Salivary Gland Changes

When salivary gland alterations were observed in rats and mice following subchronic glyphosate admin-

istration, additional research was undertaken to investigate the mechanism by which this change occurred (NTP, 1992). It was hypothesized that glyphosate produced the alterations via weak β -adrenergic activity. However, careful examination of the data and consideration of other factors do not support this hypothesis.

In a follow-up study conducted by NTP (1992), male rats were fed glyphosate for 14 days at a dietary level of 50,000 ppm, which was the high-dose level from the subchronic study, while other rats were given isoproterenol (a β -adrenergic agonist). Both compounds produced increased salivary gland weights. When isoproterenol was given with propranolol, a β -blocker, there was no increase in salivary gland weight. In contrast, salivary gland weights remained elevated when propranolol was administered along with glyphosate, although the elevation was not as high as that seen when glyphosate was administered alone. The inability of a β -blocker to significantly inhibit the effects of glyphosate indicates that it does not act as a β -agonist.

Other factors were considered to help resolve questions of salivary gland effects and causality. First, if glyphosate was a β -agonist material, its effect would be to stimulate β -receptors in other effector organs and produce a characteristic set of cardiocirculatory effects such as increased heart rate and cardiac output as well as decreased blood pressure and peripheral resistance. None of these effects were noted in two pharmacology studies in which glyphosate was administered intravenously to dogs and rabbits (Tai *et al.*, 1990; Takahashi, 1992). Similarly, it is known that isoproterenol and other β -agonists cause myocardial necrosis (Lockett, 1965) and enlargement of heart ventricles (Schneyer, 1962) following prolonged treatment. Glyphosate did not produce any effects in heart tissue, even after chronic exposure at very high doses, providing additional support to the argument that glyphosate does not act as a β -agonist. Furthermore, glyphosate is not structurally related to known β -agonists. It is concluded that glyphosate has no significant β -adrenergic activity and therefore could not produce salivary gland changes via β -agonist activity.

Indeed, there are a number of other potential mechanisms of salivary gland alteration, including nonchemical modes of action. For example, salivary gland secretion has been shown to be affected by the texture and moistness of feed (Jackson and Blackwell, 1988), and salivary gland enlargement has been caused by malnutrition. Glyphosate could be acting by such a nonchemical mechanism. Because glyphosate is a strong organic acid, dietary administration at relatively high levels may cause mild oral irritation leading to increased salivary gland size and flow. In the chronic exposure studies of glyphosate there were several salivary gland changes. These changes were: (1) most pronounced in the parotid gland, responsible for secretion of serous fluid in response to such stimuli as acidic

materials; (2) absent in the sublingual gland that releases mucous fluid in response to other stimuli; and (3) observed to an intermediate degree in the submandibular gland that contains a mixture of mucous and serous secreting cells. This pattern of observations is consistent with the hypothesis that the salivary gland change observed are a biological response to the acidic nature of glyphosate.

Regardless of the mechanism involved, there are several reasons to conclude that the salivary gland change observed is of doubtful toxicological significance. The change occurred in the absence of other significant adverse effects, indicating that the health of the animals was not adversely impacted. Furthermore, the salivary gland alteration was not associated with any adverse clinical or pathological effect even in chronic studies. Such alteration cannot be considered preneoplastic because the tumor rate was not increased in chronic bioassays. These salivary gland changes are not known to represent any pathologic condition and have no relevance to humans. Therefore, the finding is not considered to be either toxicologically significant or adverse.

Potential for Endocrine Modulation

The U.S. Environmental Protection Agency has developed a two-tiered screening and testing strategy for evaluating the endocrine modulating potential of environmental substances. Tier I screening assays include both *in vitro* and short-term *in vivo* assays designed to detect substances with the ability to interact with the endocrine system. Tier II tests include long-term *in vivo* multigeneration reproductive toxicity tests that more definitively determine and characterize any endocrine modulating effects for subsequent risk assessment. In addition to efforts within the United States, other countries, led primarily by Japan and the OECD (Office of Economic and Development) member countries, are developing similar *in vitro* and *in vivo* approaches to assess chemicals for endocrine activity.

In Vitro Assays

A number of *in vitro* assays have been developed to assess potential endocrine modulating effects of a chemical. The primary use of these *in vitro* assays in hazard identification is to screen large numbers of chemicals and to determine which ones should be further studied in more definitive *in vivo* testing. As with any screening strategy, these assays are generally designed such that any errors are likely to be false positives rather than false negatives. When a positive result is reported in these assays, *in vivo* work is indicated to confirm, characterize, and quantify the true nature of the endocrine-modulating properties of the chemical. The recent concern over endocrine modulation and the availability of inexpensive screens is

leading to the testing of chemicals in these *in vitro* assays regardless of the size and reliability of the more definitive *in vivo* database.

Petit *et al.* (1997) tested glyphosate and 48 other chemicals in two complementary assays: one measuring activation of the estrogen receptor from rainbow trout in a yeast system and the other evaluating vitellogenin production in a trout liver cell culture system. Glyphosate had no estrogenic activity in either assay.

In Vivo Studies

The repeat dose *in vivo* toxicology studies required by the U.S. EPA and other worldwide regulatory agencies detect modulation of endocrine system activity (Carney *et al.*, 1997; Stevens *et al.*, 1997, 1998). These studies are more predictive than *in vitro* screening assays as they assess a variety of endocrine-sensitive endpoints in animals that are capable of metabolic activation and/or detoxication. These studies also use extended exposure periods encompassing various stages of endocrine development. Endocrine-active substances affecting a single or multiple endocrine target sites invariably initiate direct or compensatory biochemical, cellular, and/or histopathological processes which will be detected in standard toxicology studies required for pesticide registration in Canada, Europe, Japan, and the United States. A comprehensive histopathological assessment of endocrine tissues combined with gross organ pathology and organ weight data allows detection of all adverse endocrinopathies.

The standard toxicology studies that provide valuable information on potential endocrine-modulating effects include subchronic, chronic, developmental, and reproduction studies. The multigeneration rat reproduction study is the most definitive study for evaluating the potential of substances to produce endocrine-modulating effects in humans and other mammals (U.S. EPA, 1998b). This study evaluates effects on gonadal development/function, estrous cycles, mating behavior, fertilization, implantation, *in utero* development, parturition, lactation, and the offsprings' ability to survive, develop, and successfully reproduce. A comprehensive histopathological assessment of all major organ systems also is a prominent feature of these studies. Developmental toxicity studies evaluate effects on many of these same processes, while subchronic and chronic studies incorporate numerous direct and indirect evaluations of endocrine and reproductive tissues such as target organ weights and a comprehensive assessment of endocrine organ pathology.

There were no definitive findings in the subchronic, chronic, developmental, or reproductive toxicity studies indicating that glyphosate or AMPA produced any endocrine-modulating effects (see Tables 3 and 4). Histopathological observations of endocrine and reproduc-

tive tissues from animals in a chronic and a two-generation toxicity study are presented in Tables 3 and 4 to illustrate the magnitude and comprehensive nature of these assessments. The data clearly indicate that glyphosate exposure had no adverse histological consequence on any reproductive or endocrine tissue from either male or female rats even at exaggerated dosage levels. Negative results also were obtained in a dominant lethal study conducted at very high doses. While this latter test is typically used to assess genetic toxicity, substances that affect male reproductive function through endocrine modulating mechanisms can also produce effects in this type of study. To summarize, no effects were observed in two independent, multigeneration reproduction studies conducted at several doses ranging from low levels to those that exceed human glyphosate exposure by several orders of magnitude. Thus, a sufficient battery of studies has been conducted to evaluate the potential for endocrine modulation. Taken together, results from all studies demonstrate that glyphosate and AMPA are not reproductive toxicants and do not perturb the endocrine system. The U.S. EPA (1998a) reviewed these studies and also concluded that there was no evidence to suggest that glyphosate produces endocrine-modulating effects.

The results of subchronic and developmental toxicity tests on POEA also showed no evidence of endocrine modulation. In addition, the metabolism of POEA would be expected to produce short-chain carboxylic acids and similar derivatives, which are not considered to be endocrine modulators. The lack of any indications of hormonal activity in subchronic toxicity studies with Roundup herbicide supports the conclusion that POEA does not possess endocrine modulating activity.

Summary

The endocrine-modulating potential of glyphosate has been evaluated in a variety of studies including *in vitro* assays and standard *in vivo* toxicology studies. The *in vivo* studies comprehensively assess endocrine functions that are required for reproduction, development, and chronic health. Glyphosate produced no effects in *in vitro* assays, and there was no indication of changes in endocrine function in any of the *in vivo* studies. Results from standard studies with AMPA, Roundup herbicide, and the POEA surfactant also failed to show any effects indicative of endocrine modulation. Therefore, it is concluded that the use of Roundup herbicide has no potential to produce adverse effects on endocrine systems in humans nor in other mammals.

Potential for Neurotoxicity

As discussed above, glyphosate, AMPA, POEA, and Roundup herbicide have been tested in numerous subchronic, chronic, and reproductive toxicity studies. In

TABLE 3
Summary Incidence of Microscopic Findings in Reproductive and Endocrine Organs
in a 2-Year Rat Study with Glyphosate^a

Dose levels (ppm)	0	2000	8000	20,000
Epididymis(-ides)				
Decrease/absence of sperm	12 (60) ^b	14 (60)	17 (60)	19 (60)
Granuloma, sperm	1 (60)	0 (60)	1 (60)	0 (60)
Atrophy	1 (60)	0 (60)	0 (60)	0 (60)
Hyperplasia, ductal epithelium	0 (60)	0 (60)	1 (60)	1 (60)
Testis(-es)				
Degeneration/atrophy, seminiferous tubules, bilateral	14 (60)	16 (60)	14 (60)	22 (60)
Arteritis/periarteritis	17 (60)	12 (60)	18 (60)	21 (60)
Hyperplasia, interstitial cells	1 (60)	1 (60)	0 (60)	1 (60)
Spermatocoele	1 (60)	0 (60)	0 (60)	0 (60)
Interstitial cell tumor	2 (60)	0 (60)	3 (60)	2 (60)
Granuloma, spermatoc	0 (60)	1 (60)	0 (60)	1 (60)
Degeneration/atrophy, seminiferous tubules	6 (60)	8 (60)	8 (60)	8 (60)
Ovaries				
Cyst(s), follicular	13 (60)	7 (60)	8 (60)	9 (59)
Cyst(s), paraovarian bursa	0 (60)	1 (60)	1 (60)	1 (59)
Granulosa cell tumor	0 (60)	2 (60)	1 (60)	0 (59)
Lymphoma in@trate	0 (60)	0 (60)	0 (60)	1 (59)
Theca cell tumor	1 (60)	0 (60)	0 (60)	0 (59)
Arteritis/periarteritis	0 (60)	0 (60)	1 (60)	0 (59)
Metastatic cortical carcinoma, adrenal	0 (60)	0 (60)	0 (60)	1 (59)
Uterus				
Dilatation, endometrial glands	7 (60)	6 (60)	5 (60)	3 (59)
Squamous metaplasia, endometrial glands	6 (60)	2 (60)	1 (60)	2 (59)
In ⁻ ammation, endometrium	0 (60)	1 (60)	2 (60)	2 (59)
Dilation of uterine lumen (hydrometra)	7 (60)	9 (60)	16 (60)	8 (59)
Hyperplasia, endometrial glands	0 (60)	0 (60)	2 (60)	3 (59)
Hypertrophy/hyperplasia, endometrial stroma	1 (60)	0 (60)	0 (60)	1 (59)
Prostate				
In@trate, mononuclear/lymphocytic, interstitial	3 (60)	0 (60)	1 (60)	1 (60)
In ⁻ ammation	11 (60)	14 (60)	16 (60)	16 (60)
Hyperplasia, acinar epithelium	2 (60)	4 (60)	1 (60)	4 (60)
Adenocarcinoma	1 (60)	0 (60)	0 (60)	0 (60)
Atrophy	1 (60)	2 (60)	0 (60)	2 (60)
Mucoid epithelial metaplasia	0 (60)	1 (60)	1 (60)	1 (60)
Cyst	0 (60)	0 (60)	1 (60)	0 (60)
Seminal vesicle(s)				
In ⁻ ammation	2 (60)	3 (60)	3 (60)	3 (60)
Atrophy	11 (60)	5 (60)	12 (60)	13 (60)
Distended with secretion	2 (60)	0 (60)	0 (60)	0 (60)
In ⁻ ammation, coagulation gland	1 (60)	5 (60)	1 (60)	2 (60)
Secretion decreased	0 (60)	2 (60)	0 (60)	1 (60)
Hyperplasia, epithelium	0 (60)	1 (60)	1 (60)	0 (60)
Pituitary				
Adenoma, pars distalis	34 m (60) 45 f (60)	32 m (58) 48 f (60)	34 m (58) 46 f (60)	31 m (59) 34 f (59)
Hyperplasia, pars distalis	10 m (60) 6 f (60)	10 m (58) 7 f (60)	9 m (58) 7 f (60)	10 m (59) 8 f (59)
Vacuolation, pituicytes	0 m (60) 0 f (60)	0 m (58) 0 f (60)	0 m (58) 2 f (60)	1 m (59) 1 f (59)
Mammary gland				
Adenoma/adeno@broma@broma	0 m (43) 25 f (58)	1 m (31) 24 f (54)	1 m (41) 27 f (59)	1 m (37) 28 f (57)
Galactocoele(s)	3 m (43) 8 f (58)	3 m (31) 14 f (54)	2 m (41) 4 f (59)	2 m (37) 9 f (57)
Prominent secretory activity	6 m (43) 29 f (58)	8 m (31) 26 f (54)	11 m (41) 28 f (59)	5 m (37) 28 f (57)
Hyperplasia	0 m (43) 16 f (58)	2 m (31) 19 f (54)	2 m (41) 13 f (59)	0 m (37) 22 f (57)
Carcinoma/adenomacarcinoma	1 m (43) 13 f (58)	0 m (31) 10 f (54)	0 m (41) 14 f (59)	0 m (37) 9 f (57)

TABLE 3D Continued

Dose levels (ppm)	0	2000	8000	20,000
Adenoacanthoma	0 m (43)	0 m (31)	0 m (41)	1 m (37)
Inflammation, granulomatous	0 f (58)	1 f (54)	0 f (59)	1 f (57)
Inflammation, chronic	1 m (43)	0 m (31)	0 m (41)	0 m (37)
	0 f (58)	1 f (54)	0 f (59)	0 f (57)
Fibrosis	0 f (58)	1 f (54)	0 f (59)	0 f (57)
Carcinosarcoma	1 f (58)	0 f (54)	0 f (59)	1 f (57)
Thyroid				
Hyperplasia/cystic hyperplasia, follicular epithelium	4 m (60)	2 m (58)	1 m (58)	2 m (60)
	1 f (60)	1 f (60)	0 f (60)	3 f (60)
C cell adenoma	2 m (60)	4 m (58)	8 m (58)	7 m (60)
	2 f (60)	2 f (60)	6 f (60)	6 f (60)
C cell hyperplasia	5 m (60)	1 m (58)	6 m (58)	5 m (60)
	10 f (60)	5 f (60)	9 f (60)	5 f (60)
Follicular cyst(s)	2 m (60)	1 m (58)	3 m (58)	3 m (60)
	2 f (60)	1 f (60)	0 f (60)	1 f (60)
C cell carcinoma	0 m (60)	2 m (58)	0 m (58)	1 m (60)
	0 f (60)	0 f (60)	1 f (60)	0 f (60)

Note. m, males; f, females.

^a Data from Stout and Ruecker (1990).

^b All deaths reported. Incidence (total number of animals examined).

another study, the IPA salt of glyphosate was administered to dogs for 6 months (Reyna and Thake, 1983). The design of all these studies included a number of parameters that evaluate the potential of these materials to produce neurotoxicity. Histopathologic examinations were routinely conducted on brain, spinal cord, and peripheral nervous tissues such as the sciatic nerve. In addition, the animals in these studies were regularly observed for unusual clinical signs of toxicity that would indicate any functional effect on the nervous system. The developmental toxicity studies conducted with glyphosate, AMPA, and POEA included examinations to determine if there were adverse effects in the developing nervous system. There was no evidence of neurotoxicity in any of these studies.

Roundup was administered to beagle dogs as a single oral dose at levels of 59 and 366 mg/kg (Naylor, 1988). Animals were continuously observed for 2 to 3 h after dosing for clinical signs of toxicity. A detailed neurological examination consisting of 12 different measurements of spinal, postural, supporting, and consensual reflexes was performed before treatment, during the postadministration observation period, and again on the following day. Reflexes appeared normal, and there were no clinical signs indicative of neuromuscular abnormalities.

It is concluded that there was no evidence of neurotoxicity in any of the toxicology studies even at very high doses. The U.S. EPA has evaluated all the data with glyphosate and also reached this conclusion (U.S. EPA, 1998a). It was also noted by the Agency that no neuropathy or alterations were seen in the fetal nervous system in the developmental and reproductive toxicology studies.

The Potential for Synergistic Interactions

Herbicides are often applied in combination with other active ingredients and/or surfactants. This has raised the question of possible synergistic interactions (i.e., more than additive response) between these materials. It is noteworthy that studies published in the scientific literature, including a comprehensive study of more than 400 combinations of pesticides, have shown that synergism is rare (Carpenter *et al.*, 1961; Keplinger and Deichmann, 1967; Federation of German Research Societies, 1975; Groten *et al.*, 1997). The toxicity of glyphosate has been evaluated in combination with several surfactants and/or other herbicides in acute studies with rats and aquatic species. Based on the results of these studies, it is concluded that the simultaneous exposure of glyphosate and other materials does not produce a synergistic response.

Data that fail to demonstrate evidence for synergism between weakly estrogenic chemicals by the absence of the production of greater response to mixtures have been presented by various investigators. In a study conducted by Baba *et al.* (1989), oral LD₅₀s were determined in rats for each component of Roundup herbicide. The interactions were evaluated by the graphic method of Shirasu *et al.* (1978), and ratios were calculated using Finney's equation. It was concluded that the interaction between glyphosate and the POEA surfactant was antagonistic rather than synergistic. Heydens and Farmer (1997) used the harmonic mean formula of Finney to compare the ^a expected^a and ^a observed LD₅₀ and LC₅₀ values for rats and aquatic species exposed to several combinations of glyphosate with other herbicides and/or surfactants. None of the

TABLE 4
Summary of Reproductive and Microscopic Findings in a Two-Generation Rat
Reproduction Study with Glyphosate^a

Dose levels (ppm):	0			30,000		
	FO	F1A	F1A-remate	FO	F1A	F1A-remate
Total paired females	30	30	30	30	30	30
Females with con®rmed copulation/total paired	96.7%	100.0%	83.3%	100.0%	96.7%	86.7%
Pregnant/total paired	80.0%	93.3%	53.3%	93.3%	86.7%	83.3%
Pregnant/con®rmed copulation	82.8%	93.3%	64.0%	93.3%	89.7%	96.2%
Males with con®rmed copulation/total paired	86.7%	93.3%	70.0%	90.0%	83.3%	80.0%
Males impregnating females/total paired	70%	90.0%	46.7%	83.3%	80.0%	76.7%
Males impregnating females/con®rmed copulation	80.8%	96.4%	66.7%	92.6%	96.0%	95.8%
Precoital length for pregnant animals (days)	3.6	2.8	3.7	3.7	3.2	2.5
Gestational length (days)	22.3	22.4	22.4	22.3	22.6	22.5
Litter size						
Female	6.7	6.6	6.0	5.7	5.5	5.6
Male	6.6	5.4	5.9	5.8	5.3	5.2
Combined	13.3	12.0	11.9	11.5	10.8	10.7
Terminal body weight (g)						
Males	549.6	625.0		503.5*	543.4*	
Females	296.3	316.2		265.9*	284.8*	
Organ weights (g)						
Ovary(-ies)	0.1343	0.1579		0.1269	0.1587	
testis(-es)	5.9959	6.6090		5.7905	6.3857	
Histopathology of tissue/organs						
Epididymis(-ides)						
Vacuolation, duct epithelium	1 (30) ^b					
In¯ammation, mononuclear, interstitial		1 (30)		5 (30)		
Chronic in¯ammation, ¢brosis					1 (29)	
Periepididymal adipose tissue, in¯ammation, granulomatous					1 (29)	
Hypospermia, unilateral					1 (29)	
Testis						
Hypoplasia/atrophy seminiferous tubule, bilateral	2 (30)	1 (30)		1 (30)		
Degeneration seminiferous tubules, unilateral		1 (30)			1 (29)	
Hemorrhage		1 (30)				
Granuloma, spermatic					1 (29)	
Ovary(-ies)						
Cyst(s)		3 (30)		1 (30)	3 (30)	
Inactive		1 (30)				
Uterus						
Remnant, implantation site	10 (29)	11 (29)		7 (29)	13 (29)	
Mesometrium, calci¢ed implantation remnant	1 (29)					
Dilation of uterine lumen (hydrometra)	5 (29)	5 (29)		9 (29)	7 (29)	
Pigment deposition		3 (29)			7 (29)	
Mononuclear in¢ltrate endometrium		1 (29)			1 (29)	
Vascular necrosis mesometrium		1 (29)				
Vagina						
Mononuclear cell in¢ltrate					1 (29)	
Prostrate						
Chronic in¯ammation	14 (30)	4 (29)		12 (30)		
Mononuclear cell in¢ltrate		1 (29)			1 (29)	
Edema		2 (29)				
Seminal vesicle						
Mononuclear cell in¢ltrate		1 (29)			1 (29)	

TABLE 4D Continued

Dose levels (ppm):	0			30,000		
	FO	F1A	F1A-remate	FO	F1A	F1A-remate
Pituitary						
Cyst(s)		2 m (30)			2 m (28)	
		2 f (30)			3 f (23)	
Adenoma, pars distalis		1 f (30)				
Mammary gland						
Galactocoele		1 f (28)				
Mononuclear cell, in@ltrate		1 m (25)			1 f (30)	

Note. Significantly different from control, **P* # 0.01. m, males; f, females.

^a Data from Reyna (1990).

^b Incidence (total number of animals examined).

combinations showed any evidence of synergism. Martinez and Brown (1991) studied the interaction between glyphosate and POEA administered intratracheally to rats at very high dose levels. Based on the resulting pulmonary damage and mortality data, the authors concluded that a synergistic response occurred. However, no supporting mathematical analysis or other basis for the conclusion was presented. In a similar study, Adam *et al.* (1997) investigated the oral and intratracheal toxicity of POEA, glyphosate, and Roundup herbicide. In contrast to the conclusions of Martinez and Brown, these authors concluded that there appeared to be no synergism with glyphosate and POEA. In conclusion, there is no reliable evidence indicating synergistic interactions between glyphosate and other materials.

HUMAN EXPERIENCE

Irritation Studies

Dermal irritation studies with Roundup herbicide in human volunteers have shown, at most, only mild effects. In two separate studies, exposure to Roundup at a normal spray dilution (; 0.9% glyphosate as the IPA salt, IPAG) or at a higher concentration (; 4.1% IPAG) produced no skin irritation or sensitization when applied for 24 h (Shelanski, 1973). Maibach (1986) evaluated Roundup and commonly used household products (Johnson & Johnson baby shampoo, Ivory dishwashing detergent, and Pinesol liquid cleaner) for acute irritation, cumulative irritation, and photoirritation, as well as allergic and photoallergic activity. Mild irritation was observed in a few individuals as a result of application of concentrated product directly to skin for 24 h; however, no dermal sensitization, photoirritation, or photosensitization was observed. The authors concluded that Roundup herbicide and the baby shampoo had less irritant potential than either the cleaner or dishwashing detergent. There was no difference between Roundup and the baby shampoo in terms of irritation potential.

Occupational Exposure

One controlled study that investigated the potential effects of Roundup exposure in applicators has been reported in the scientific literature. The remaining information involves reports of effects from individuals following use of the product. These include data gathered by the State of California and three published studies.

Jauhainen *et al.* (1991) evaluated the short-term effects of glyphosate exposure in agricultural herbicide applicators. Data from applicators who sprayed Roundup was compared to results obtained from pre-exposure baseline examinations as well as to data from a group of nonexposed control workers. There were no effects on hematology, clinical chemistry, ECG, pulmonary function, blood pressure, or heart rate 1 week after application.

The State of California requires that physicians report all cases of known or suspected pesticide exposures presented to them by patients. If a person experiences some pain/discomfort and merely suspects that they have been exposed to a pesticide, the case will be included as a "suspected illness" in the State's report. This liberal reporting procedure with no verification often results in the listing of a pesticide simply because the patient recalls using or being near the material at some point in the past and does not necessarily imply a cause-and-effect relationship. Based on this information, Pease *et al.* (1993) reported that glyphosate-containing products were the third most common cause of skin and eye irritation among agricultural workers and ranked fifteenth for systemic and respiratory symptoms. Relative to the level of product use, however, glyphosate ranked only 12th for the number of irritation symptoms reported.

Careful examination of the California data further indicates that the number of cases reported simply reflects greater use of the product relative to other herbicides and shows that glyphosate has relatively low toxicity among pesticides used in the State. Despite widespread use in California among pesticide

applicators and homeowners, there have been very few confirmed illnesses due to glyphosate (California EPA, 1996). In 1994, for example, glyphosate exposure was reported in only 25 cases, of which only 13 were considered "definitely or probably." Eleven of the 13 cases involved only minor and reversible eye irritation; the other two cases were a headache and an apparent misdiagnosis of reaction to hydrocarbon solvent, which is not an ingredient in Roundup. The California Department of Pesticide Regulation noted in its 1994 report that the majority of the people (80%) affected by glyphosate experienced only irritant effects and, of the 515 pesticide-related hospitalizations recorded over the 13 year period, none was attributed to glyphosate.

Acquavella *et al.* (1999) evaluated ocular effects in 1513 cases of Roundup herbicide exposure reported to a certified regional center of the American Association of Poison Control Centers (AAPCC) from 1993 through 1997. The large majority of reported exposures were judged by specialists at the center to result in either no injury (21%) or only transient minor symptoms (70%). None of the reported exposures resulted in permanent change to the structure or function of the eye. Based on these findings, it is concluded that the potential for severe ocular effects in users of Roundup herbicides is extremely low.

A limited number of studies have also investigated the results of occupational exposure in humans. Temple and Smith (1992) reported that accidental exposure to Roundup herbicide can result in eye and skin irritation. These investigators also reported other symptoms such as tachycardia, elevated blood pressure, nausea, and vomiting. However, such effects probably represent a nonspecific response related to the pain associated with eye and/or skin irritation. Talbot *et al.* (1991) found that accidental dermal exposure to six subjects did not result in any symptoms. Jamison *et al.* (1986) evaluated pulmonary function in workers handling "ax which was previously retted (a process which softens and separates bbers by partial rotting) either by a dew-retting process or via the application of Roundup 6 weeks prior to harvest. It was reported that changes in pulmonary function were greater in the individuals exposed to preharvest retted "ax compared to those inhaling the dew-retted vegetation. However, the levels of glyphosate still present in the "ax which was sprayed 6 weeks before harvesting would be extremely low, if present at all, and could not be responsible for the altered pulmonary function observed. Rather, it is most likely that the two retting procedures produced dust particles with different physical characteristics and/or resulted in different microorganism populations in the retted vegetation.

Ingestion

Various studies reported in the literature describe the effects observed after accidental and intentional ingestion of Roundup. Accidental exposure results in, at most, only mild effects; no deaths have been reported. However, intentional ingestion of large amounts in suicide attempts has produced severe effects including severe hypotension, renal failure, and, in some instances, death (Sawada *et al.*, 1988; Menkes *et al.*, 1991; Talbot *et al.*, 1991; Tominack *et al.*, 1991; Temple and Smith, 1992). In those cases that result in mortality, death usually occurs within a few days of ingestion. In one study, it was estimated that the amount of concentrated Roundup intentionally ingested in fatal cases was 184 mL (range of 85 to 200), although it was noted that ingestion of much larger amounts resulted in only mild to moderate symptoms (Talbot *et al.*, 1991). Sawada *et al.* (1988) and Tominack *et al.* (1991) reported that average ingestion of 104 and 120 mL were not fatal while mean ingestion of 206 and 263 mL did produce death. Based on this information, it is concluded that the acute toxicity of Roundup in humans is low and is consistent with that predicted by the results of acute toxicity studies in rats.

The nature of the clinical symptoms observed in cases of suicide suggests that hypovolemic shock was the cause of death (Sawada *et al.*, 1988; Tominack *et al.*, 1989). Because similar responses have been observed in cases involving ingestion of other surface-active agents, it has been suggested that the acute toxicity of Roundup is likely due to the surfactant. This hypothesis is supported by results from a study in dogs that showed that the surfactant (POEA) produced a hypotensive effect, but glyphosate did not (Tai *et al.*, 1990). Based on other data, these investigators concluded that the hypovolemic shock was due to a cardiac depressant effect of very high doses of the surfactant. Talbot *et al.* (1991) reported that the clinical data generated in cases of intentional ingestion did not support hypovolemia as the cause of cardiovascular shock. Other factors, such as injury to the larynx and aspiration of vomitus into the lungs, were linked to mortality and specific pathological changes observed after intoxication with Roundup herbicide (Menkes *et al.*, 1991; Chang *et al.*, 1995; Hung *et al.*, 1997).

Summary

Results from several investigations establish that the acute toxicity and irritation potential of Roundup herbicide in humans is low. Specifically, results from controlled studies with Roundup showed that skin irritation was similar to that of a baby shampoo and lower than that observed with a dishwashing detergent and an all-purpose cleaner; no dermal sensitization, photoirritation, or photosensitization reactions were

observed. Furthermore, the incidence of occupational-related cases involving Roundup is low given the widespread use of the product. Data from these cases indicated some potential for eye and skin irritation with the concentrated product, but exposure to dilute spray solutions rarely resulted in any significant adverse effect. Most importantly, no lasting dermal or ocular effects were noted, and significant systemic effects attributable to contact with Roundup did not occur. Studies of Roundup ingestion showed that death and other serious effects occurred only when large amounts were intentionally ingested for the purpose of committing suicide. These data confirmed that the acute oral toxicity in humans is low and consistent with that predicted by the results of laboratory studies in animals.

EXPOSURE ASSESSMENT

Overview and Summary

Exposure assessment is generally conducted in a tiered manner, beginning with an assessment that employs simplifying assumptions to arrive at an upper bound estimate. When that upper limit exposure level is found to provide an adequate safety margin over toxicologic findings of concern, further refinement to identify a more accurate realistic exposure level is not generally undertaken. In the majority of instances, the first tier upper limit assessment overestimates actual exposure by 1 to 2 orders of magnitude.

Exposure of the general population to the components of Roundup herbicide is very low and occurs almost exclusively from the diet. Two population subgroups with maximal opportunity for additional exposure can be identified for purposes of this exposure assessment. These include professional pesticide applicators and children age 1 to 6 years. An upper limit on the magnitude of potential exposure to glyphosate, AMPA, and the POEA surfactant was calculated for these applicator and child subgroups, based on the sum of highest possible exposures by dietary and other possible exposure routes. Realistic exposure for these subgroups and for the general population is expected to be a small fraction of this extreme estimate.

Applicators are directly involved during herbicide spraying operations and can be exposed on a repeated basis. Although this exposure through occupational activities does not necessarily occur each day for a working lifetime, herbicide exposure was treated as chronic to establish an upper bound estimate. To be conservative, the applicator's body weight was assumed to be 65.4 kg, in order to account for both male and female workers. This approach was designed to provide a maximum estimate of exposure on a milligrams per kilogram of body weight per day basis. Children age 1 to 6 years experience the highest dietary exposure because they eat more food per kilogram of body weight than

other age groups. Young farm children may also contact pesticide residues in their surrounding environment and thus have more opportunity for potential incremental exposure. We therefore selected this age class as a high-end subgroup for nonoccupational exposure among the general population.

Worst-case estimates of exposure to glyphosate, AMPA, and POEA were calculated for aggregated acute and chronic exposure scenarios. The aggregate exposure for chronic scenario was based on the ingestion of food commodities and drinking water containing trace residues in addition to exposures from the spraying of Roundup by applicators. The acute scenario incorporated occasional, inadvertent exposure routes (spray drifting onto bystanders, reentry into previously treated areas). This scenario also included additional sources from unintentional exposures that can occur on a rare basis during specific activities (e.g., consumption of wild berries and mushrooms that might be sprayed inadvertently; the activity of swimming in a pond with herbicide residues). The aggregated acute scenario included the chronic exposure sources in addition to exposure resulting from these inadvertent exposure routes.

Though worst-case assumptions were used throughout, the calculated exposures to glyphosate, AMPA, and POEA were shown to be low (Table 5). Calculating for glyphosate, acute and chronic exposures to applicators were 0.125 and 0.0323 mg/kg body wt/day, respectively; for young children, the values were 0.097 and 0.052 mg/kg body wt/day. Estimates of exposure to AMPA were also very low, ranging from 0.0048 to 0.0104 mg/kg body wt/day. The calculated exposures for POEA ranged from 0.026 mg/kg body wt/day for chronic exposure in children to 0.163 mg/kg body wt/day for acute applicator exposure.

Conservative assumptions used in analysis of both the acute and the chronic exposure scenarios ensure that conditions for upper-limit or worst-case exposure estimates were established. For example, estimates of dietary intake used maximum residue levels (MRLs), the highest legal residue levels allowed on crops. If actual measured residue levels were used in place of the MRL values and other factors were considered (e.g., percentage of crop treated, reduction in residues from washing, processing), dietary exposure estimates would be substantially reduced (10- to 100-fold or more). Estimates of acute drinking water exposure used the highest measured value resulting from 5 years of drinking water monitoring in the United Kingdom (1.7 ppb). This conservative assumption exaggerates glyphosate exposure, since 99% of the UK data did not detect glyphosate above 0.1 mg/L. For applicators, the highest measured value from all monitoring work was used to estimate acute exposures. Conservative estimates were included for other sources of exposure as well. Exposure estimates using more realistic as-

TABLE 5
Worst-Case Daily Exposure Estimates for Glyphosate, AMPA, and POEA (mg/kg/day)

Nature/source of exposure	Glyphosate			AMPA			POEA		
	Female adult applicator		1- to 6-year-old female child	Female adult applicator		1- to 6-year-old female child	Female adult applicator		1- to 6-year-old female child
	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute
Routine Dietary Application	23.8	23.8	51.9	51.9	4.8	4.8	11.9	11.9	26
Occasional	56.2	8.5	0	0	0	0	128	20.6	0
Drinking water	3.6	2.1	6.7	2.1	6.7	2.1	1.8	1.1	5.5
Reentry	10 ²²	10 ²³	10 ²³	10 ²³	10 ²³	10 ²³	10 ²²	10 ²³	10 ²²
Bystander	0	0	0	0	0	0	0	0	0
Infrequent/rare	0	0	0	0	0	0	0	0	0
Swimming	1.28	0	6.5	0	0	0	0.64	0	3.2
Wild Foods	45	0	45	0	0	0	23	0	23
Aggregate ^a	125	32.3	97	52	4.8	10.4	162.9	32.5	91.1

^a Aggregate exposure is the sum of dietary, drinking water, and application derived contributions, plus 45 mg glyphosate/kg/day or either 23 (adults) or 65 (children) mg POEA/kg/day acute exposure to account for all incidental exposures related to occasional behaviors. For AMPA, aggregate exposure is the sum of dietary and drinking water contributions, since no other routes provided significant incremental contributions.

sumptions than those described in Table 9 would yield substantially lower values than those determined in this assessment, and thus the worst-case analysis exposure estimates represent overestimates.

Dietary Exposure to Residues in Food

Glyphosate

In order to obtain approval for the application Roundup onto food or feed crops, it is necessary to measure residues of herbicide and related products that represent the maximum levels of glyphosate and AMPA that hypothetically occur in food using the highest and most frequent herbicide applications. These data support legally binding MRLs (called "tolerances" in the United States) that are established in most countries worldwide for the resulting food commodities. In addition, international MRLs continue to be established by Codex Committee on Pesticide Residues to facilitate international trade of agricultural products.

An initial benchmark for assessment of maximum dietary exposure can be obtained by making the simplifying assumption that all food commodities contain the highest legal residue levels (MRLs). This calculation relies on the unrealistic assumptions that 100% of crop acreage is treated with Roundup at the highest allowed rates and that all resulting food contains the greatest permissible residues, which are not reduced through processing, washing, or cooking. When glyphosate MRLs are multiplied by average daily food consumption data and summed for all foods that can be treated, a theoretical maximum daily intake (TMDI) exposure is calculated. Of course, there are differences among countries in the magnitude of established MRLs and in food consumption estimates. The WHO considers "average regional diets in the Global Environment Monitoring System Food Contamination Monitoring and Assessment Programme (GEMS/Food) when making safety assessments for Codex MRLs (WHO, 1997). Comparison of present MRLs among different countries indicates that U.S. MRLs for glyphosate are both more numerous and of equal or greater magnitude than in most other countries. The resulting U.S. TMDI should therefore represent an upper bound exposure compared to other jurisdictions.

The TAS EXPOSURE-1 software⁵ incorporates food consumption data for all U.S. crop commodities and provides a dietary exposure estimate for the U.S. population as a whole and for more than 20 specific population subgroups. Using the present U.S. MRLs, the TAS model provided TMDI exposure estimates for

⁵ Technical Assessment Systems, Inc. (TAS). Exposure-1 software. TAS, Inc. The Flour Mill, 1000 Potomac St. NW, Washington, DC 20007. 1-202-337-2625. Calculations completed using 1977±1978 food consumption data.

glyphosate residues of 23.8 mg/kg body wt/day for the U.S. population and 51.9 mg/kg body wt/day for children age 1 to 6 years. These values represent maximum daily dietary exposure for the adult worker and the child subgroups, respectively, for both the chronic and the acute scenarios. These glyphosate exposure estimates include contributions from all presently allowed uses, including all currently approved glyphosate-tolerant crops. These dietary exposure estimates are slightly higher than comparable estimates obtained from the WHO dietary consumption model or the German intake model (Kidwell *et al.*, 1995) because of regional differences in food consumption and MRLs. Refinement of this maximum estimate could be achieved from a consideration of actual measured residue levels rather than MRLs, realistic application rates, the fraction of crops actually treated, and the effect of processing, washing, cooking, blending, etc. Thus, actual values could be incorporated to arrive at more realistic exposures. For example, U.S. residue data from wheat treated with maximum rates of Roundup showed the highest glyphosate residue to be 2.95 mg/g, with a mean level of 0.69 mg/g, compared to a MRL of 5 mg/g (Allin, 1989). Glyphosate-tolerant soybeans treated at maximum allowed rates and frequency contained glyphosate residues at the highest level of 5.47 mg/g, with a mean of 2.36 mg/g, compared to the MRL of 20 mg/g (Steinmetz and Goure, 1994). Clearly, only a fraction of cropped acres receive a Roundup treatment, which can be estimated to be in the range of 10 to 50%. Because the ingredients in Roundup are water soluble, processing, washing, and cooking are expected to further reduce residues. Therefore, considering the combination of factors, it is expected that realistic chronic dietary exposure to glyphosate and the other ingredients in Roundup are at least 1 to 2 orders of magnitude lower than the TMDI estimates used in this assessment. Greater accuracy in these refinements is not needed at this time for glyphosate, because even the extremely conservative TMDI assessments have shown that dietary exposure are acceptable compared to dosages leading to experimental toxicological findings (see Table 9).

AMPA

AMPA has historically been considered a minor part of the plant residue derived from glyphosate treatment. Measured levels of AMPA in plant residue studies have averaged about 10% of the glyphosate level (U.S. EPA, 1993) and have been summed with glyphosate to arrive at total residue for MRL setting and risk assessment purposes (U.S. EPA, 1997b). Some jurisdictions have determined that AMPA is not of toxicological concern (U.S. EPA, 1993) and do not include it in MRLs any longer. Canada and the JMPR have proposed to establish a separate MRL for AMPA in cases

where it is the major residue in glyphosate-tolerant crops that express an enzyme that converts glyphosate to AMPA as a mechanism of tolerance.

In order to arrive at a maximum estimate of AMPA dietary exposure, it has been assumed that AMPA represents 20% of the TMDI glyphosate exposure. This is a compromise between the bulk of the historical data that indicates that AMPA residues are 10% of glyphosate levels and the more recent findings that specific glyphosate-tolerant crops have a higher ratio. Based on this assumption, AMPA dietary exposure was 4.8 mg/kg body wt/day for the U.S. population and 10.4 mg/kg/day for children age 1 to 6 years.

POEA

Dietary exposure to POEA surfactant is not significant, since surfactants are not believed to be systemically transported in crop plants in the same manner as glyphosate and AMPA (Sherrick *et al.*, 1986; Smith and Foy, 1966). The assumption made for purposes of this assessment was that residues would occur in proportion to glyphosate exposures, based on the relative amount of each in the formulation (2:1, glyphosate: POEA). Using this ratio, TMDI exposure for POEA residues are 11.9 and 26 mg/kg body wt/day for the U.S. population and for children age 1 to 6 years, respectively.

Occupational Dermal and Inhalation Exposure during Application

The level of worker exposure to Roundup during herbicide spraying applications has been reported in both forestry (Centre de Toxicologie du Quebec, 1988; Jauhainen *et al.*, 1991; Lavy *et al.*, 1992) and agricultural (Kramer, 1978) sites. Most studies have used passive dosimetry to determine the quantity of herbicide deposited during spraying. Deposition is measured from analysis of material from gauze patches located on workers skin and clothing. These deposition results provide a basis for calculating systemic exposure using *in vivo* data for dermal penetration of glyphosate that shows 2% or less reaches systemic circulation (Wester *et al.*, 1991). Inhalation exposure was determined by measurement of glyphosate levels in air sampled from the workers' breathing zones. This allowed calculation of exposure estimates using hourly breathing rates (U.S. EPA, 1997a) and making the further assumption that all inhaled spray mist was bioavailable. Some studies have also utilized urine monitoring of exposed workers to quantify excreted glyphosate (Lavy *et al.*, 1992). Workers' body burdens were calculated based on data showing that 95% of glyphosate administered intravenously to rhesus monkeys is excreted via urine (Wester *et al.*, 1991).

In field studies used to estimate exposure, workers generally wore protective clothing as directed accord-

ing to the label, and that was considered normal for their occupation. They performed a variety of duties, including mixing and loading spray solutions, backpack, handgun, and boom spraying, weeding, and scouting fields. In the studies utilizing passive dosimetry, gauze patches from both outside and inside of shirts were analyzed to determine the degree of protection provided by work clothing.

Taken together, these studies show that dermal and inhalation exposure to Roundup during application is very low. Body burden doses of glyphosate resulting from dermal contact during application measured by passive dosimetry methods ranged from 0.003 to 4.7 mg/kg body wt/work h. Clothing reduced exposure to the arms an average of 77% (Lavy *et al.*, 1992). Glyphosate levels in applicators' breathing air ranged from undetectable to 39 mg/m³ of air (Kramer, 1978), with the vast majority of quantifiable results being less than 1.3 mg/m³ (Jauhiainen *et al.*, 1991). Tank-filling operations created the highest dermal exposure (hands), ranging from 4×10^{-22} to 12 mg/kg body wt/filling operation (Kramer, 1978), assuming that each operation lasted 10 min.

The results of biological monitoring showed that most of 350 urine samples analyzed from workers contained no measurable glyphosate, with detection limits ranging from 0.01 to 0.1 mg/mL. On a few isolated occasions, urine levels of 0.025 to 0.095 mg/mL were found, although urine volume data were not provided to permit accurate estimation of body burden (Centre de Toxicologie du Quebec, 1988; Jauhiainen *et al.*, 1991). The maximum body burden among workers based on urine monitoring data has been estimated at 8.0×10^{-22} mg/kg body wt/h worked, assuming that all urine without measurable glyphosate contained concentrations of one-half of the method's detection limit (Lavy *et al.*, 1992). The monitoring estimate based on urine herbicide levels was within the range of passive dosimetry predictions, thus lending support to the utility of passive monitoring techniques as reasonable measures of true exposure.

For the present assessment of an adult applicator working for 8 h per day, weighing 65.4 kg and breathing 1.3 m³ of air/h during moderate outdoor exertion (U.S. EPA, 1997a), a maximum daily acute exposure to glyphosate was estimated using the highest of the above reported measurements. Dermal exposure from one 10-min mixing and loading operation was 12 mg/kg body wt. Dermal exposure was 38 mg/kg body wt, and inhalation exposure was 6.2 mg/kg body wt during 8 h of application. Summed together, the adult worker's peak acute exposure during application was calculated as 56.2 mg/kg body wt/day.

Chronic applicator exposure was estimated using average rather than peak exposure measurements. Average exposure during a 10-min tank-filling operation was 6.3 mg/kg body wt (Kramer, 1978). Average dermal

exposure (Kramer, 1978; Lavy *et al.*, 1992) during application was 5.1 mg/kg body wt/day. Average air concentration was difficult to calculate, since many measurements were below detection limits (Jauhiainen *et al.*, 1991). Utilizing an average air concentration of 2.87 mg/m³ from Kramer (1978), where the assumption was made that the air concentration associated with each undetectable result was at the detection limit, chronic inhalation exposures for the applicator were 0.46 mg/kg body wt/day. Summed together, and amortizing for a 5-day working week, chronic applicator exposure to glyphosate was estimated to be 8.5 mg/kg body wt/day.

AMPA

There is no application-related exposure to AMPA, since its presence is dependent on environmental degradation and therefore not present in spray solutions. However, calculations were made for predicting rat NOAELs based on AMPA in technical glyphosate.

POEA

No data were available that directly quantify systemic exposure to POEA arising from application. Dermal deposition or inhalation of POEA would occur in proportion to glyphosate exposures, based on the relative amount of each in the formulation, as above. It was further assumed that dermal penetration of POEA was 10% of that deposited on skin, which is a conventional default assumption for surfactants (Martin, 1990; Lundehn *et al.*, 1992). Based on these assumptions, utilizing the glyphosate exposure data, peak acute 1-day systemic exposure to POEA was calculated to be 30 mg/kg body wt (dermal during one mixing and mixing/loading operation), 95 mg/kg body wt (dermal during application), and 3.1 mg/kg body wt (inhalation). Summed, the total acute daily exposure was 128 mg/kg body wt. Chronically, using the same assumptions and amortizing for a 5-day work week, mixing/loading contributed 11.3 mg/kg body wt/day, dermal exposure during application contributed 9.1 mg/kg body wt/day, and inhalation contributed 0.23 mg/kg body wt/day. Summed, chronic application-related exposure to POEA was estimated to be 20.6 mg/kg body wt/day.

Nonoccupational Exposure during Application

Nonoccupational application-related acute exposures to Roundup can also occur during residential applications of Roundup to control problem weeds in the home and garden. These applications will be primarily spot treatments and edging, utilizing very small quantities on a few occasions during a year. Occupational exposure data, normalized to a kilogram of glyphosate applied basis, showed the highest exposure was 28 mg of glyphosate/kg body wt/kg of glyphosate

applied (Lavy *et al.*, 1992). It was acknowledged that homeowners may not be well trained in application techniques nor always utilize appropriate personal protective equipment. Therefore, the maximum residential exposure was estimated to be 10-fold greater than the highest measured for the forestry workers (up to 280 mg/kg body wt/kg applied). If a homeowner applied an entire 10-L container of Ready-To-Use Roundup spray solution (1% glyphosate concentration) and experienced such an exaggerated exposure, the summed inhalation and dermal exposure would be 28 mg/kg body wt or about 50% of the peak acute occupational exposure. Based on this analysis, the risk assessment for adult occupational application-related exposure is sufficient to cover nonoccupational homeowner exposures.

Consumption of Water

Glyphosate

Glyphosate has rarely been detected in drinking water, even though many studies have been done. This is expected because it binds tightly to soil and degrades completely into natural substances (U.S. EPA, 1993; WHO, 1994a). The maximum concentration of glyphosate in well water identified in the scientific literature was 45 mg/L, which was reported 21 days after the second application of Roundup at a very high rate (4.6 kg/ha) to a gravel soil surrounding an electrical substation in Newfoundland (Smith *et al.*, 1996). This was not a drinking water well, but it serves as an extreme worst-case upper limit for glyphosate measured under field conditions. As a result of the 0.1 mg/L limit for any pesticide in drinking water in the European Union, many thousands of drinking water samples have been routinely analyzed for glyphosate and other pesticides. The best available data on glyphosate levels in drinking water was obtained from the United Kingdom Drinking Water Inspectorate. During the years 1991 to 1996, 5290 samples derived from surface and ground water sources were analyzed (Hydes *et al.*, 1996, 1997). All but 10 were below the 0.1 mg/L limit. Among those 10 reported detections, concentrations ranged from 0.2 to 1.7 mg/L. The exceedences detected have not been confirmed by follow-up investigation, and it is possible that some are false positives, since follow-up investigation of other low-level positive water detections have often not confirmed the initial report. As an example, 1 of the 10 UK detections was a sample from Llanthony, Wales, that was initially reported to have 0.53 mg glyphosate/L. Subsequent investigation of the site and repeated sampling and analysis did not reveal any amount of glyphosate in the water supply, nor could the source of the initial false finding be identified (Palmer and Holman, 1997). Even allowing for the assumption that all 10 UK detections are accurate,

99th percentile exposure to glyphosate via drinking water is below 0.1 mg/L.

Irrespective of measured concentrations, U.S. EPA has established a maximum contaminant level (MCL) of 700 mg/L as a health-based upper legal limit for glyphosate in drinking water (U.S. EPA, 1992b). However, using the GENEEC and SCI-GROW environmental fate models, U.S. EPA more recently estimated glyphosate concentration in drinking water for the purpose of risk assessment (U.S. EPA, 1998). These fate models were used by the U.S. EPA as coarse screening tools to provide an initial sorting of chemicals with regard to drinking water risk. U.S. EPA concluded from the models that the average concentrations of glyphosate that could be expected in surface and ground water, respectively, were 0.063 and 0.0011 mg/L, 4 to 5 orders of magnitude below the MCL that is legally considered safe for chronic exposure.

Surface waters can be directly treated with Roundup for the purpose of aquatic weed control, which can lead to temporary glyphosate levels in water. However, it is believed that all surface waters that would subsequently be used for drinking purposes would undergo various purifying treatments, such as standard chlorine or ozone treatments. These treatments are known to be effective at removing glyphosate and AMPA from the water (Speth, 1993).

It is difficult to identify appropriate upper-limit glyphosate concentrations that can be used to characterize acute and chronic exposure from drinking water. If regulatory limits are selected, predicted exposure could vary through many orders of magnitude, depending on the jurisdictional limits used. Therefore, for this assessment, the peak acute exposure was considered to be no more than 1.7 mg/L, the highest reported measured value in the UK drinking water program. The same data indicated that chronic exposure could not exceed 0.1 mg/L, the European Union exposure limit. This value is supported by the U.S. EPA model calculations. Based on figures for mean daily water consumption and body weights (U.S. EPA, 1997a) for an adult (1.4 L and 65.4 kg) and a preschool child (0.87 L and 13 kg), the acute exposure to glyphosate from drinking water was calculated to be 3.6×10^{22} (adult) and 0.11 (child) mg/kg body wt. The chronic exposures, calculated in the same manner, were 2.1×10^{23} (adult) and 6.7×10^{23} (child) mg/kg body wt/day.

AMPA

AMPA can also occur in water as a result of glyphosate degradation following Roundup treatments, although its peak concentration is found later and at levels that are only 1 to 3% of peak glyphosate concentrations (Feng *et al.*, 1990; Goldsborough and Beck, 1989). To be conservative and still consistent with the glyphosate assessment above, AMPA levels were as-

sumed to be 0.1 mg/L for both the acute and the chronic exposure levels. Calculations using the body weight and consumption parameters described predicted acute and chronic adult and child exposures as 2.1×10^{23} and 6.7×10^{23} mg/kg body wt/day, respectively. These water-derived AMPA exposures are much less than 1% of those derived from food and are therefore essentially insignificant, eliminating a need for further refinement of the concentration information. AMPA can also be formed from degradation of phosphonate detergents and sequestering agents used in cooling water treatment (Steber and Wierich, 1987), but possible exposures derived from nonglyphosate sources were not considered here.

POEA

No direct analytical data were found from which exposures to POEA via drinking water could be independently estimated. Surfactants are expected to bind tightly to soil and sediment particles and dissipate quickly via microbial degradation (Van Ginkel *et al.*, 1993; Giger *et al.*, 1987). For the present assessment, the level of POEA in drinking water was assumed to be proportionate to glyphosate exposures, based on the relative amount of each in the formulation, as discussed above. Acute exposure to POEA from drinking water was calculated to be 1.8×10^{22} (adult) and 5.5×10^{22} (child) mg/kg body wt. The chronic exposures, calculated in the same manner, were 1.1×10^{23} (adult) and 3.3×10^{23} (child) mg/kg body wt/day.

Reentry of Treated Areas

Glyphosate

Exposure to glyphosate during worker reentry into agricultural fields 1, 3, and 7 days after Roundup treatment has been measured using the passive dosimetry methods (Kramer, 1978). Two fields studied contained a mixed population of 0.5 m tall grasses and very tall (1.5 m) grassy weeds, while one was composed only of the shorter weeds. As expected, inhalation exposure during reentry was negligible because spray mist had dissipated and glyphosate is a nonvolatile salt (Franz *et al.*, 1997). Based on the measured 2% dermal penetration rate (Wester *et al.*, 1991) acute exposures derived from these data were 3.9×10^{23} to 2.6 mg/kg body wt/h for an adult, with a mean value of 0.52 mg/kg body wt/h. Exposures were 10-fold greater for reentry into tall grass compared to short, and potential for exposure decreased over time posttreatment, with values on day 7 averaging 3% of those on day 1. Adjusting for a child's body surface area of 40% that of an adult (Richardson, 1997; U.S. EPA, 1997a) and a child's lower body weight, exposures of a child reentering the same fields were calculated to be 0.01 to 5.2 mg/kg body wt/h.

One scenario to consider assumes that a 1- to 6-year-

old farm child could on occasion enter a recently treated field and could remain there either playing or helping a parent for a significant period of time. Such activity might occasionally occur for a 5-h period on a particular day, producing a maximum exposure of 26 mg of glyphosate/kg body wt for the child. This route of exposure for a child was considered to be an infrequent, acute event with no calculation necessary to account for chronic exposure.

The calculations above indicated that maximum female adult dermal reentry exposure rate to glyphosate on an hourly basis was 55% of peak dermal exposures experienced during application activities, and the ranges were of similar magnitude. Since acute and chronic applicator exposure levels have been established for the worker, these values, therefore, also account for any reentry exposure a woman may experience as part of her other activities. During any work time period, a woman can be making an application or reentering a recently treated field, but not both, since Roundup's herbicidal effects develop too slowly to justify repeated treatment after periods of less than 2 weeks.

AMPA

Since reentry exposure involves transfer from treated surfaces, no AMPA would be present, because AMPA is produced by metabolic conversion in a plant or within soil microbes and would not be found as surface residue.

POEA

POEA surfactant would be deposited on surfaces in a ratio that is proportional to its concentration in the formulation and would therefore be available from surface contact. Acute exposure was calculated to be 65 mg/kg body wt for the child, after adjusting for the assumed greater (10%) dermal penetration rate. Reentry exposures to POEA for the adult worker would be less than experienced by an applicator and should be covered by the applicator-derived exposure assessment.

Bystander Exposure during Application

It is also possible for the farm child bystander to experience inadvertent acute dermal and inhalation exposure to Roundup from spray drift during an application, if he/she is adjacent to the application area. Substantial scientific research has been devoted to measurement, estimation, and modeling of off-site spray drift (Grover, 1991). The expected exposure is a fraction of the target treatment rate, reduced by a factor influenced by the separation distance, environmental variables, and application parameters. Aerial applications maximize drift because the droplets are

released at a higher altitude. For preliminary ecological risk assessment, U.S. EPA has assumed spray drift exposures could be 5% of the aerial application rate (U.S. EPA, 1995). Off-target deposition of glyphosate has been measured (Feng *et al.*, 1990), and after aerial application, less than 0.1% of the on-site deposition was intercepted 8 m from the spray boundary.

For the purpose of retaining maximum conservatism, it was assumed that off-site bystander dermal and inhalation exposures could be 10% of an applicator's on-site peak 8-h acute exposures (calculated above). Contributions from mixing and loading operations were excluded. The summed calculated exposure estimate for the child bystander was 4.4 mg of glyphosate/kg body wt/day. No adjustment was made for the child's reduced breathing volume, body weight, or skin surface area, because this was intended as a simple upper bound estimate. No application-related bystander exposure to AMPA will occur, since it is only formed upon environmental degradation. Daily POEA acute exposure, based on relative concentrations in the formulation and calculated as 10% of peak on-site applicator exposure, was 9.8 mg/kg body wt. Such bystander exposures would be infrequent, since Roundup is only applied to a given location a few times each year, at most, and were considered only for the acute risk scenario.

Possible Inadvertent Exposures Derived from Specific Activities

In the course of this assessment, preliminary estimates were made to determine whether other possible inadvertent environmental contact might contribute significantly to incremental glyphosate exposures. Several routes of exposure were considered for glyphosate, AMPA, and POEA. These included (1) dermal contact with or accidental ingestion of treated soil; (2) inhalation or ingestion of residential dust derived from treated soil; (3) dermal contact with waters or aquatic sediments during swimming or showering; (4) accidental ingestion of treated surface waters while swimming; and (5) ingestion of inadvertently sprayed wild foods such as berries or mushrooms. Using standard exposure parameters (U.S. EPA, 1988, 1992b, 1997a) and conservative assumptions about expected environmental concentrations and frequency of such contact, only the latter two potential incremental exposure routes were found to contribute possible exposures greater than 1 mg/kg body wt/day. Infrequent incremental exposures below this level were judged to be insignificant compared to recurring dietary, drinking water, and application-related exposure levels.

Glyphosate formulations can be used to control surface weeds on ponds, lakes, rivers, canals, etc., according to label rates up to about 4.2 kg glyphosate per hectare, which can result in significant water concen-

trations immediately after treatment. These glyphosate levels in water dissipate quickly (Goldsborough and Beck, 1989), and it is unlikely that such weedy water bodies would attract swimmers or bathers. However, if such an application were made to water 0.25 m deep, the immediate resulting glyphosate concentration could be 1.68 mg/mL if it were mixed into the water column. It has been estimated that accidental ingestion of water during 1 h of swimming could be 50 mL (U.S. EPA, 1988), so maximal incremental exposure to glyphosate was estimated to be 1.28 and 6.5 mg/kg body wt for a swimming adult and child, respectively. Such exposures will be very rare and therefore only were considered as a possible increment to the acute exposure scenario. AMPA will not be present at significant concentrations in water shortly after treatment. POEA surfactants are not necessarily included in glyphosate formulations intended for aquatic uses. If a surfactant were to be included in an application to aquatic systems, such a substance would be applied at doses approximately half that of glyphosate. We conclude that swimming in water from areas recently treated with Roundup would produce an incremental POEA oral exposure potential of 0.64 and 3.2 mg/kg body wt for a swimming adult and child, respectively.

Roundup application along roadsides or in forestry creates the potential for accidental overspray of wild foods that could later be collected for consumption. Consideration of actual use patterns, the percentage of forests or roadsides that actually receive treatment, and the resulting phytotoxic effects on the sprayed plants suggests that inadvertent exposure will be extremely unlikely. However, since residue levels of glyphosate arising from a mock overspray of berries has been measured (Roy *et al.*, 1989), the potential dietary exposure was quantified. Peak glyphosate residue levels in raspberries were 19.5 mg/g (Roy *et al.*, 1989), and it was estimated that maximal consumption for an individual might be 150 g for an adult and 30 g for a 1- to 6-year-old child. These parameters predict an exposure of 45 mg/kg body wt for both subgroups and relies on the assumption that the surface residues were not reduced by washing before consumption. Exposure at this level is approximately equal to the total TMDI dietary estimate, suggesting that it could be a significant but rare incremental contributor to acute exposure scenario. AMPA residues were also quantified in the raspberries, but were less than 1% of those for glyphosate (Roy *et al.*, 1989) and are therefore insignificant. POEA surfactant residues were not measured, but can be assumed to be 50% of those for glyphosate, based on the relative formulation content, leading to potential incremental oral POEA exposures of 23 mg/kg.

Aggregate Exposure Estimates

The calculated acute and chronic exposure estimates for each population subgroup for glyphosate, AMPA, and POEA are summarized in Table 5. For glyphosate, acute exposures to applicators and children were calculated to be 0.125 and 0.097 mg/kg body wt/day, respectively; chronic exposures in these subgroups were 0.0323 and 0.052 mg/kg body wt/day, respectively. Levels of exposure to AMPA were very low (0.005 ± 0.010 mg/kg body wt/day). Estimates of exposure to POEA were 0.163 and 0.0911 mg/kg body wt/day for the acute scenarios, while chronic exposure estimates were four to five times lower than the acute values.

RISK CHARACTERIZATION

Introduction

Risk characterization involves a determination of the likelihood that an adverse health effect will result from exposure to a given substance. The method used in this assessment to characterize risk was the margin of exposure (MOE) analysis, in which dose levels from animal toxicity tests were compared to conservative, upper-limit estimates of human exposure. To evaluate the risks resulting from chronic exposure, estimates of human exposure were compared to the lowest dose that produced no adverse effects in repeat dose studies with animals. For acute effects, human exposure estimates were compared to oral LD₅₀ values in rats. The MOE is defined as the quotient of the NOAEL divided by the aggregate human exposure calculated from total daily intake from all sources.

The introduction of safety factors is a concept that has had wide acceptance in the scientific and regulatory communities around the world. The Joint European Committee on Food Additives (JECFA) proposed principles for determining a margin of safety (MOS) and has developed a methodology to establish an acceptable value for a factor that would directly link animal toxicological data to human health and safety (FAO/WHO, 1958). For purposes of extrapolation of data from animals to man, the figure is based on an established dosage level that causes no demonstrable effects in the animals. The MOS allows for any species differences in susceptibility, the numerical differences between the test animals and the exposed human population, the greater variety of complicating disease processes in the human population, the difficulty of estimating the human intake, and the possibility of synergistic action. JECFA stated that the 100-fold margin of safety applied to the maximum ineffective dosage (expressed in mg/kg body wt/day) was believed to be an adequate factor (FAO/WHO, 1958). The value of 100 has been regarded as comprising two factors of

ten to allow for interspecies and interindividual (intraspecies) variation (WHO, 1994b).

The validity and size of safety/uncertainty factors and their application across many substances including pesticides have undergone periodic reevaluation (Renwick and Lazarus, 1998). By and large the allocation of appropriate safety factors is considered on a case-by-case basis, relying on analysis of the total weight of evidence including a consideration of data gaps (WHO, 1990). WHO Scientific Groups have confirmed a 100-fold safety factor as an adequate and useful guide, particularly when there are few toxicological data gaps (WHO, 1967, 1994b).

The National Research Council Report on Pesticides in the Diets of Infants and Children (NRC, 1993) indicated that the current 10-fold intraspecies factor adequately protects for socioeconomic, nutritional, and health status factors that influence the vulnerability of children to environmental toxicants. The NRC report (NRC, 1993) also indicated the possible requirement for an additional 10-fold uncertainty factor to be applied to the ADI for pesticide residues in food to protect infants in the absence of specific data on developmental toxicity. The Environmental Protection Agency sometimes applies a 3- to 10-fold margin of safety for infants and children in the case of threshold effects. This additional factor would account for pre- and post-natal toxicity and is applied when existing data indicate a possible increased sensitivity to infants or to children or when the database of effects is incomplete (U.S. EPA, 1998a).

Recently the U.S. EPA conducted a review of the risks associated with aggregate exposures to glyphosate residues from all sources (U.S. EPA, 1998a). Using a margin of exposure analysis, it was concluded that available data support the use of the standard 100-fold uncertainty factor for glyphosate, and that an additional ten-fold uncertainty factor is not needed to protect the safety of infants and children.⁹ There was no suggestion of increased severity of effect in infants or children or of increased potency or unusual toxic properties of glyphosate in infants and children. Therefore, in the view of U.S. EPA, there are no concerns regarding the adequacy of the standard MOE/safety factor of 100-fold (U.S. EPA, 1998a).

Identification of NOAELs

The toxicity of glyphosate and AMPA has been investigated in a comprehensive battery of studies. In addition, POEA has been tested in acute, subchronic, genetic, and developmental toxicity studies. A summary of the no-effect levels identified in the various studies conducted with these materials is provided below and in Tables 6-8. The no-effect levels selected for risk characterization are discussed below.

TABLE 6
Glyphosate NOAELs for Toxicological Endpoints

Type of study and species tested	NOAEL (mg/kg/day)	Comments	Study reference
Subchronic toxicity			
Mouse, 90-day	2310	Based on decreased b.w. ^a gain	Tierney, 1979
Mouse, 90-day	630	Based on salivary gland lesions	NTP, 1992
Rat, 90-day	\$ 1445	No adverse effects at HDT ^b	Stout, 1987
Rat, 90-day	209	Salivary gland changes at the lowest dose tested not considered toxicologically significant	NTP, 1992
Dog, 12-month	\$ 500	No adverse effects at HDT	Reyna and Ruecker, 1985
Chronic toxicity			
Mouse, 24-month	885	Based on liver effects	Knezevich, 1983
Rat, 26-month	\$ 33	No adverse effects at HDT	Lankas, 1981
Rat, 24-month	409	Based on decreased b.w. gain and ocular lesion	Stout and Ruecker, 1990
Developmental toxicity			
Rat	1000	Based on maternal and fetal effects	Tasker, 1980a
Rabbit	175	Based on maternal toxicity	Tasker, 1980b
Reproductive toxicity			
Rat	\$ 30	No adverse effects at HDT	Schroeder, 1981
Rat	694	Based on systemic toxicity; no reproductive effect	Reyna, 1990

^a b.w., body weight.

^b HDT, highest dose tested.

Glyphosate

The lowest no-effect level for purposes of risk characterization for adults is the NOAEL of 175 mg/kg body wt/day; this value is based on the occurrence of maternal toxicity at the highest dosage tested (350 mg/kg body wt/day) in the rabbit developmental toxicity study. The NOAELs in the chronic rodent or dog stud-

ies, multigeneration reproduction studies and the rat developmental toxicity study ranged from approximately 400 to 1000 mg/kg body wt/day.

Calculation of an MOE based on the endpoint of maternal toxicity is biologically irrelevant for the young (1 to 6 years). Nevertheless, such an analysis was conducted by the U.S. EPA and is included here to

TABLE 7
AMPA NOAELs for Toxicological Endpoints

Type of study and species tested	NOAEL (mg/kg/day)	Comments	Study reference
Subchronic toxicity			
Rat, 90-day	400	Based on urinary tract infection	Estes, 1979
Dog, 90-day	263	No adverse effects at HDT	Tompkins, 1991
Chronic toxicity	. 2.8	AMPA present at 0.68% in glyphosate study; no effects at middose	Stout and Ruecker, 1990
Rat, 24 month			
Developmental toxicity			
Rat	400	Based on maternal and fetal b.w. ^a effects	Holson, 1991
Reproductive toxicity			
Rat	. 4.2	AMPA present at 0.61% in glyphosate study; no effects at middose	Reyna, 1990

^a b.w., body weight.

TABLE 8
POEA NOAELs for Toxicological Endpoints

Type of study and species tested	NOAEL (mg/kg/day)	Comments	Study reference
Subchronic toxicity			
Rat, 1-month	57	Based on decreased b.w. ^a gains	Ogrowsky, 1989
Rat, 3-month	36	Based on decreased b.w. and intestinal irritation	Stout, 1990
Dog, 14-week	30	Based on reduced b.w. and gastrointestinal irritation	Filmore, 1973
Developmental toxicity			
Rat	15	Based on slight decrease in food consumption and mild clinical signs	Holson, 1990

^a b.w., body weight.

demonstrate that even use of an unrealistic assumption provides an acceptable margin of exposure. The NOAEL of 209 mg/kg body wt/day from the second subchronic rat study (NTP, 1992) was also used to calculate the MOE for children because this value was the next higher no-effect level and was based on a more relevant toxicological endpoint.

AMPA

Some regulatory agencies have determined that AMPA is not of toxicological concern and do not include it in assessments of risk. Other agencies have summed AMPA with glyphosate to arrive at total exposure for risk assessment purposes. Nevertheless, a separate MOE analysis was conducted here to characterize the risks associated with AMPA exposure. The NOAEL of 400 mg/kg body wt/day in the subchronic rat study is considered to be the most appropriate value for use in this risk assessment. As noted previously, AMPA was also assessed as a component of the test material used in the glyphosate reproduction and chronic/oncogenicity studies. The lowest NOAEL established in these studies was 2.8 mg/kg body wt/day for chronic effects. This value was also used in the MOE analysis to provide a very conservative estimate of the overall no-effect level for this material.

POEA

The lowest NOAEL of 15 mg/kg body wt/day was selected as a reference point for risk assessment purposes; this value was based on maternal toxicity in the rat developmental toxicity study. As noted above with glyphosate, calculation of an MOE for children based on a NOAEL for maternal toxicity is not biologically relevant. Therefore, the MOE was also calculated using the NOEL of 36 mg/kg body wt/day from the subchronic rat study.

Estimation of Risks to Humans from Acute or Chronic Exposure

The potential risks to humans resulting from exposure to glyphosate, AMPA, and POEA were determined for pesticide applicators and farm children age 1 to 6 years. Applicators were selected because they have the highest potential for exposure among adult subpopulations. The children were selected because they receive the highest dietary intake of all subpopulations on a milligram per kilogram of body weight per day basis and are considered to represent a sensitive subpopulation. Chronic risks were evaluated using a MOE analysis in which MOE values for each of the three substances were calculated by dividing the applicable NOAEL by the estimates of maximum chronic human exposure (Table 9). To assess acute risks, oral LD₅₀ values in rats were divided by estimates of maximum acute human exposure. All MOE values were rounded to three significant figures. Determination of an acceptable MOE relies on the judgment of the regulatory authority and varies with such factors as nature/severity of the toxicological endpoint observed, completeness of the database, and size of the exposed population. For compounds which have a substantial toxicological database, MOE values of 100 or more are generally considered to indicate that the potential for causing adverse health effects is negligible.

Glyphosate

Chronic exposure. In children, the exposure resulting from ingestion of glyphosate residues in food and water was calculated to be 0.052 mg/kg body wt/day. Exposure to professional applicators, which included exposure resulting from the spraying operation along with dietary intake, was estimated to be 0.0323 mg/kg body wt/day. Comparison of these values to the NOAEL of 175 mg/kg body wt/day based on maternal toxicity in the rabbit developmental toxicity study produced MOEs of 3370 and 5420 in children and adults,

TABLE 9
Summary of No-Observed-Adverse-Effect Levels (NOAEL), Worst-Case Exposure Estimates, and Margins of Exposure (MOE) for Glyphosate, AMPA, and POEA

Chemical	NOAEL (mg/kg/day)	Basis of NOAEL	Worst-case chronic exposure (mg/kg/day)		Margin of exposure ^a	
			Adults	Children	Adults	Children
Glyphosate	175	Maternal toxicity in developmental toxicity study			5,420	3,370
	209	90-day rat study	0.0323	0.052	∅	4,020
AMPA	400	90-day rat and developmental toxicity studies			83,300	38,500
	.28	Based on AMPA content in glyphosate used for chronic rat study	0.0048	0.0104	.583	.269
POEA	15	Maternal toxicity in developmental toxicity study			461	577
	36	90-day rat study	0.0325	0.026	∅	1380

^a All MOE values rounded to three significant figures.

respectively. Using the more biologically relevant NOAEL of 209 mg/kg body wt/day from the subchronic rat study, the MOE for children was 4020.

Acute exposure. Total acute exposure for children living on a farm was estimated by adding incidental exposure (e.g., reentry, bystander, consumption of sprayed wild foods, swimming in a pond) to that resulting from normal dietary intake as described above. The resulting exposure value was 0.097 mg/kg body wt/day. For applicators, the corresponding aggregate acute exposure value was calculated to be 0.125 mg/kg body wt/day. The acute exposure calculation utilized peak dermal and inhalation measurements (instead of the mean value used for chronic exposure calculations) and included significant exposure from the consumption of sprayed wild foods. The oral LD₅₀ of glyphosate is greater than 5000 mg/kg. The acute exposure values for both children and adult applicators are approximately 40,000 to 50,000 times lower than this value, indicating an extremely low potential for acute toxicity.

AMPA

Chronic exposure. The only significant source of AMPA exposure could occur from ingestion of treated crops in which the plant/bacterial metabolite has been formed. Herbicide application does not result in exposure to AMPA, and the metabolite does not occur to an appreciable degree in water. The chronic exposure estimates for AMPA were calculated to be 0.0104 mg/kg body wt/day for children and 0.0048 mg/kg body wt/day for adults. MOEs were calculated using the derivative

NOAEL of 400 mg/kg body wt/day from the subchronic rat study and the lowest estimated NOAEL (.28 mg/kg body wt/day) derived from long-term studies with glyphosate. The corresponding MOEs are .269 to 38,500 for children and .583 to 83,300 for adult applicators.

Acute exposure. Individuals are not exposed to AMPA as bystanders or via reentry into sprayed areas, and levels of the metabolite in water are negligible. Therefore, acute exposure estimates are identical to chronic scenarios and were calculated to be 0.0104 mg/kg body wt/day for children and 0.0048 mg/kg body wt/day for adults. Based on the oral LD₅₀ value of 8300 mg/kg, acute MOEs for children and adults are 798,000 and 1,730,000, respectively.

POEA

Chronic exposure. Aggregate exposure was calculated to be 0.026 mg/kg body wt/day in children and 0.0325 mg/kg body wt/day in adult applicators. The ingestion of food residues accounted for virtually all of the exposure in children, while dermal/inhalation exposure resulting from the spraying operation was the predominant pathway contributing to applicator exposure. Based on the NOAEL of 15 mg/kg body wt/day for maternal toxicity in the rat developmental study, MOEs were determined to be 577 and 461 in children and adults, respectively. When the more biologically relevant NOAEL of 36 mg/kg body wt/day from the subchronic rat study was used, the resulting MOE for children was calculated to be 1380.

Acute exposure. Estimates of aggregated acute exposure in adult applicators (0.163 mg/kg body wt/day) and children (0.0911 mg/kg body wt/day) were substantially higher than those for chronic exposure. In children, this increase was primarily due to contributions from reentry exposure and, to a lesser degree, the ingestion of wild foods. The acute oral LD₅₀ of POEA is approximately 1200 mg/kg. The estimated acute exposure values are 7360 to 13,200 times lower than this value.

OVERALL CONCLUSIONS AND SUMMARY STATEMENT

This assessment was conducted for adult applicators and children (age 1 to 6 years) because they have the highest potential exposures. Estimates of exposure described for these two subpopulations and used in these risk calculations are considered excessive compared to those likely to result in the general population from the use of Roundup herbicide. MOE analyses compare the lowest NOAELs determined from animal studies to worst-case levels of human exposure. MOEs of greater than 100 are considered by authoritative bodies to indicate confidence that no adverse health effects would occur (WHO, 1990). The MOEs for worst-case chronic exposure to glyphosate ranged from 3370 to 5420; the MOEs for AMPA ranged from greater than 269 to 83,300; and for POEA the MOEs ranged 461 to 1380. Based on these values, it is concluded that these substances do not have the potential to produce adverse effects in humans. Acute exposures to glyphosate, AMPA, and POEA were estimated to be 7360±1,730,000 times lower than the corresponding LD₅₀ values, thereby demonstrating that potential acute exposure is not a health concern. Finally, under the intended conditions of herbicide use, Roundup risks to subpopulations other than those considered here would be significantly lower. It is concluded that, under present and expected conditions of new use, there is no potential for Roundup herbicide to pose a health risk to humans.

ACKNOWLEDGMENTS

The authors acknowledge the assistance of individuals who participated in the preparation of this document. First, we are grateful to those who gathered and made available the large amount of information used to write the manuscript for this document. Second, we thank the toxicologists and other scientists at Monsanto who made significant contributions to the development of exposure assessments and through many other discussions. The authors were given complete access to toxicological information contained in the great number of laboratory studies and archival material at Monsanto in St. Louis, Missouri, and elsewhere. Key personnel at Monsanto who provided scientific support were William F. Heydens, Donna R. Farmer, Marian S. Bleeke, Stephen J. Wratten, and Katherine H. Carr. We also acknowledge the participation and assistance of Douglass W. Bryant and Cantox Health Sciences International for scientific and logistical support in the preparation of the final manuscript.

REFERENCES

- Acquavella, J. F., Weber, J. A., Cullen, M. R., Cruz, O. A., Martens, M. A., Holden, L. R., Riordan, S., Thompson, M., and Farmer D. R. (1999). Human ocular effects from self-reported exposures to Roundup herbicides. *Hum. Exp. Toxicol.* **18**, 479±486.
- Adam, A., Marzuki, A., Abdul Rahman, H., and Aziz, M. A. (1997). The oral and intratracheal toxicities of Roundup and its components to rats. *Vet. Hum. Toxicol.* **39**, 147±151.
- Allin, J. C. (1989). *Glyphosate Residues in Wheat Grain and Straw after Preharvest Treatment with Roundup herbicide*. Unpublished report, Monsanto Company.
- Anderson, D., Francis, A. J., Godbert, P., Jenkinson, P. C., and Butterworth, K. R. (1991). Chromosomal aberrations (CA), sister-chromatid exchanges (SCE) and mitogen-induced blastogenesis in cultured peripheral lymphocytes from 48 control individuals sampled 8 times over 2 years. *Mutat. Res.* **250**, 467±476.
- Auletta, C. S. (1983a). *A Dermal Sensitization Study in Guinea Pigs*. Unpublished report, Bio/Dynamics Inc., East Millstone, NJ.
- Auletta, C. S. (1983b). *A Dermal Sensitization Study in Guinea Pigs*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Auletta, C. S. (1985a). *Acute Oral Toxicity Study in Rats*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Auletta, C. S. (1985b). *Acute Dermal Toxicity Study in Rabbits*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Auletta, C. S. (1985c). *Primary Dermal Irritation Study in Rabbits (4-Hour Exposure)*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Auletta, C. S. (1985d). *Eye Irritation Study in Rabbits*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Baba, Y., Takeda, M., Yosino, K., Sagara, E., Tai, T., and Yamashita, M. (1989). Acute toxicity of the herbicide Roundup in the rat. *Jpn. J. Toxicol.* **2**, 397±400.
- Bakke, J. P. (1991). *Evaluation of the Potential of AMPA to Induce Unscheduled DNA Synthesis in the in Vitro Hepatocyte DNA Repair Assay Using the Male F344 Rat*. Unpublished report, SRI International, Menlo Park, CA.
- Bechtel, C. L. (1987). *Acute Toxicity of Roundup Herbicide Administered by Inhalation to Male and Female Sprague-Dawley Rats*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Bender, M. A., Preston, R. J., Leonard, R. C., Pyatt, B. E., Gooch, P. C., and Shelby, M. D. (1989). Chromosomal aberration and sister-chromatid exchange frequencies in peripheral blood lymphocytes of a large human population sample. *Mutat. Res.* **204**, 421±433.
- Birch, M. D. (1973). *Toxicological Evaluation of Glyphosate*. Unpublished report Younger Laboratories, Inc., St. Louis, MO.
- Birch, M. D. (1977). *Toxicity Studies on POEA*. Unpublished report, Younger Laboratories, Inc., St. Louis, MO.
- Blaszcak, D. L. (1987a). *Eye Irritation Study in Rabbits*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Blaszcak, D. L. (1987b). *Primary Dermal Irritation Study in Rabbits (4-Hour Exposure/Semi-occlusive Covering)*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Blaszcak, D. L. (1987c). *A Dermal Sensitization Study in Guinea Pigs*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Blaszcak, D. L. (1987d). *Acute Oral Toxicity Study in Rats*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Blaszcak, D. L. (1987e). *Acute Dermal Toxicity Study in Rabbits*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.

- Blaszczak, D. L. (1988). *Primary Dermal Irritation Study in Rabbits (4-Hour Exposure/Semi-occlusive Covering)*. Unpublished report, BioDynamics, Inc., East Millstone, NJ.
- Blaszczak, D. L. (1990). *Eye Irritation Study in Rabbits*. Unpublished report, BioDynamics, Inc., East Millstone, NJ.
- Bodden, R. M. (1988a). *Metabolism Study of Synthetic $^{13}\text{C}/^{14}\text{C}$ -Labeled Glyphosate and Aminomethylphosphonic Acid in Lactating Goats*. Unpublished report, Hazleton Laboratories America, Inc., Madison, WI.
- Bodden, R. M. (1988b). *Metabolism Study of Synthetic $^{13}\text{C}/^{14}\text{C}$ -Labeled Glyphosate and Aminomethylphosphonic Acid in Laying Hens*. Unpublished report, Hazleton Laboratories America, Inc., Madison, WI.
- Bolognesi, C., Bonatti, S., Degan, P., Gallerani, E., Peluso, M., Rabboni, R., Roggeri, P., and Abbondandolo, A. (1997). Genotoxic activity of glyphosate and its technical formulation Roundup. *J. Agric. Food Chem.* **45**, 1957±1962.
- Branch, D. K. (1981). *Irritation of Isopropylamine Salt of Glyphosate to Rats*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Brewster, D., Warren, J., and Hopkins, W., II (1991). Metabolism of glyphosate in Sprague-Dawley rats: Tissue distribution, identification, and quantification of glyphosate-derived materials following a single oral dose. *Fundam. Appl. Toxicol.* **17**, 43±51.
- Brusick, D., Albertini, R., McRee, D., Peterson, D., Williams, G., Hanawalt, P., and Preston, J. (1998). Genotoxicity of radiofrequency radiation: DNA/genetox expert panel. *Environ. Mol. Mutagen.* **32**, 1±16.
- California Environmental Protection Agency, Department of Pesticide Regulation (1996). *California Pesticide Illness Surveillance Program Summary Report 1994*. Sacramento, CA.
- Carney, E. W., Hoberman, A. M., Farmer, D. R., Kapp, R. W., Jr., Nikiforov, A. I., Bernstein, M., Hurtt, M. E., Breslin, W. J., Cagen, S. Z., and Daston, G. P. (1997). Estrogen modulation: tiered testing for human hazard evaluation. *Reprod. Toxicol.* **11**, 879±892.
- Carpenter, C. P., Weil, C. S., Palm, P. E., Woodside, M. W., Nair, J. H., III, and Smyth, H. F., Jr. (1961). Mammalian toxicity of 1-naphthyl-N-methylcarbamate (Sevin insecticide). *J. Agric. Food Chem.* **9**, 30±39.
- CCME (1996). *A Framework for Ecological Risk Assessment: General Guidance*. Canadian Council Of Ministers Of The Environment, The National Contaminated Sites Remediation Program, March 1996.
- Centre de Toxicologie du Quebec (1988). *Etude de L'exposition professionnelle des travailleurs forestiers exposes au glyphosate*. Centre de Toxicologie du Quebec, August 1988.
- Chang, S., Hung, D., Chow, W., and Wu, T. (1995). Endoscopy survey of glyphosate-surfactant intoxication. *J. Toxicol. Clin. Toxicol.* **33**, 553.
- Clements, C., Ralph, S., and Petras, M. (1997). Genotoxicity of select herbicides in *Rana catesbeiana* tadpoles using the alkaline single-cell gel DNA electrophoresis (Comet) assay. *Environ. Mol. Mutagen.* **29**, 277±288.
- Colvin, L. B., and Miller, J. A. (1973a). *Residue and Metabolism: The Dynamics of Accumulation and Depletion of Orally Ingested N-Phosphonomethylglycine- ^{14}C* . Unpublished report, Monsanto Company, St. Louis, MO.
- Colvin, L. B., and Miller, J. A. (1973b). *Residue and Metabolism: The Gross Distribution of N-Phosphonomethylglycine- ^{14}C in rabbits*. Unpublished report, Monsanto Company, St. Louis, MO.
- Colvin, L. B., Moran, S. J., and Miller, J. A. (1973). *The Metabolism of Aminomethylphosphonic Acid- ^{14}C in the Laboratory Rat*. Unpublished report, Monsanto Company, St. Louis, MO.
- Crebelli, R., Carere, A., Leopardi, P., Conti, L., Fassio, F., Raiteri, F., Barone, D., Ciliutti, P., Cinelli, S., and Vericat, J. A. (1999). Evaluation of 10 aliphatic halogenated hydrocarbons in the mouse bone marrow micronucleus test. *Mutagenesis* **14**, 207±215.
- De Marco, A., De Simone, C., Raglione, M., Testa, A., and Trinca, S. (1992). Importance of the type of soil for the induction of micronuclei and the growth of primary roots of *Vicia faba* treated with the herbicides atrazine, glyphosate and maleic hydrazide. *Mutat. Res.* **279**, 9±13.
- Desjardins, C., Kirton, K. T., and Hafs, H. D. (1968). Sperm output of rabbits at various ejaculation frequencies and their use in the design of experiments. *J. Reprod. Fertil.* **15**, 27±32.
- Dudek, B. R. (1987). *Acute Inhalation Study of Roundup L & G Ready-To-Use*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Ellis, L. B. M., Hershberger, C. D., and Wackett, L. P. (1999). The University of Minnesota biocatalysis/biodegradation database: Specialized metabolism for functional genomics. *Nucleic Acids Res.* **27**, 373±376.
- Environment Canada (1997). *Environmental Assessments of Priority Substances Under the Canadian Environmental Protection Act, EPS/2/CC/3E*. Chemical Evaluation Division, Commercial Chemicals Evaluation Branch, Environment Canada, Government of Canada, Ottawa, Ontario.
- Estes, F. L. (1979). *90-Day Subacute Rat Toxicity Study*. Unpublished report, International Research and Development Corporation, Mattawan, Michigan.
- FAO/WHO (1958). *Procedures for the Testing of Intentional Food Additives to Establish Their Safety for Use: Second Report of the Joint FAO/WHO Expert Committee on Food Additives*, FAO Nutrition Meeting Report Series No. 17, WHO Technical Report Series No. 144. World Health Organization, Geneva.
- Federation of German Research Societies (1975). *Effects of Combinations of Pesticides*, Communication No. IX. Commission on Agents for Crop Protection, Crop Treatment and Stored Product Protection.
- Feng, J. C., Thompson, D. G., and Reynolds, P. E. (1990). Fate of glyphosate in a Canadian forest watershed. 1. Aquatic residues and off-target deposit assessment. *J. Agric. Food Chem.* **38**, 1110±1118.
- Filmore, G. E. (1973). *14 Week Oral Subacute Study in Dogs*. Unpublished report, ICI America, Inc., Wilmington, DE.
- Franz, J. E., Mao, M. K., and Sikorski, J. A. (1997). *Glyphosate: A Unique Global Herbicide*, ACS Monograph No. 189. Am. Chem. Soc. (ACS), Washington, DC.
- Franz, T. J. (1983). *Evaluation of the Percutaneous Absorption of Roundup Formulations in Man Using an in Vitro Technique*. Unpublished report, University of Washington, School of Medicine, Seattle, WA.
- Galloway, S., Deasy, D., Bean, C., Kryanak, A., Armstrong, M., and Bradley, M. (1987). Effects of high osmotic strength on chromosome aberrations, sister chromatid exchanges and DNA strand breaks, and the relation to toxicity. *Mutat. Res.* **189**, 15±25.
- Giger, W., Ahel, M., Kock, M., Laubscher, H. U., Schaffner, C., and Schneider, J. (1987). Behaviour of alkylphenol-polyethoxylate surfactants and of nitroacetate in sewage treatment. *Wat. Sci. Technol.* **19**, 449±460. [Cited in Jobling, S., and Sumpter, J. P. (1993). Detergent components in sewage effluent are weakly oestrogenic to fish: An in vitro study using rainbow trout (*Oncorhynchus mykiss*) hepatocytes. *Aquat. Toxicol.* **27**, 361±372.]
- Goldsborough, L. G., and Beck, A. E. (1989). Rapid dissipation of glyphosate in small forest ponds. *Arch. Environ. Contam. Toxicol.* **18**, 537±544.
- Goldtenboth, F. (1977). The effect of glyphosate and ametryn on the root tip mitosis of waterhyacinth (*Eichhornia crassipes* (Mart.) Solms). *Proc. Sixth Conf. Asian-Pacific Weed Sci. Soc. (Jakarta, Indonesia)* **2**, 555±565.

- Gopalan, H. N. B., and Njagi, G. D. E. (1981). Mutagenicity testing of pesticides. III. *Drosophila*: Recessive sex-linked lethals. *Genetics* **97**(Suppl.), s44.
- Groten, J. P., Schoen, E. D., van Bladeren, P. J., Kuper, C. F., van Zorge, J. A., and Feron, V. J. (1997). Subacute toxicity of a mixture of nine chemicals in rats: Detecting interactive effects with a fractionated two-level factorial design. *Fundam. Appl. Toxicol.* **36**, 15±29.
- Grover, R. (1991). Nature, transport, and fate of airborne residues. In *Environmental Chemistry of Herbicides* (R. Grover and A. J. Cessna, Eds.), Vol. II, pp. 89±117. CRC Press, Boca Raton, FL.
- Gupta, R. C., and Spencer-Beach, G. (1996). Natural and endogenous DNA adducts as detected by ³²P-postlabeling. *Regul. Toxicol. Pharmacol.* **23**, 14±21.
- Health and Welfare Canada (1986). *National Pesticide Residue Limits in Foods*. Chemical Evaluation Division, Food Directorate, Health and Welfare Canada, Ottawa.
- Health and Welfare Canada (1992). *Health Protection Branch Internal Status Report on Glyphosate*. Food Directorate, Health Protection Branch, Health and Welfare Canada, Ottawa.
- Heydens, W. F., and Farmer, D. R. (1997). Combination toxicology of glyphosate with surfactants and other herbicides. *Fundam. Appl. Toxicol.* **36**(No. 1, Part 2), 341.
- Holson, J. F. (1990). *A developmental toxicity study of POEA in rats*. Unpublished report, WIL Research Laboratories Inc., Ashland, OH.
- Holson, J. F. (1991). *A Developmental Toxicology Study of AMPA in Rats*. Unpublished report, WIL Research Laboratories, Inc., Ashland, OH.
- Howe, R. K., Chott, R. C., and McClanahan, R. H. (1988). *Metabolism of Glyphosate in Spague±Dawley Rats. II. Identification, Characterization, and Quantitation of Glyphosate and Its Metabolites Following Intravenous and Oral Administration*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Hrelia, P., Fimognari, C., Maffei, F., Vigagni, F., Mesirca, R., Pozzetti, L., Paolini, M., and Forti, G. C. (1996). The genetic and non-genetic toxicity of the fungicide vinclozolin. *Mutagenesis* **11**, 445±453.
- Hung, D.-Z., Deng, J.-F., and Wu, T.-C. (1997). Laryngeal survey in glyphosate intoxication: A pathophysiological investigation. *Hum. Exp. Toxicol.* **16**, 596±599.
- Hydes, O. D., Jiggins, P. L., Marsden, P. K., Davies, A., Quennell, S., and Jackson, C. R. (1996). *Drinking Water Inspectorate: Nitrate, Pesticides, and Lead 1991 to 1994*. Drinking Water Inspectorate, Romney House, London.
- Hydes, O. D., Jiggins, P. L., Marsden, P. K., Walls, R. M., and Jackson, C. R. (1997). *Drinking Water Inspectorate: Nitrate, Pesticides, and Lead 1995 and 1996*. Drinking Water Inspectorate, Romney House, London.
- Jackson, C. D., and Blackwell, B.-N. (1988). Subchronic studies of doxylamine in Fischer 344 rats. *Fundam. Appl. Toxicol.* **10**, 243±253.
- Jamison, J. P., Langlands, J. H. M., and Lowry, R. C. (1986). Ventilatory impairment from pre-harvest retted *Tax*. *Br. J. Ind. Med.* **43**, 809±813.
- Jauhainen, A., Rasanen, K., Sarantila, R., Nuutinen, J., and Kangas, J. (1991). Occupational exposure of forest workers to glyphosate during brush saw spraying work. *Am. Ind. Hyg. Assoc. J.* **52**, 61±64.
- Kale, P. G., Petty, B. T., Jr., Walker, S., Ford, J. B., Dehkordi, N., Tarasia, S., Tasie, B. O., Kale, R., and Sohni, Y. R. (1995). Mutagenicity testing of nine herbicides and pesticides currently used in agriculture. *Environ. Mol. Mutagen.* **25**, 148±153.
- Keplinger, M. L., and Deichmann, W. B. (1967). Acute toxicity of combinations of pesticides. *Toxicol. Appl. Pharmacol.* **10**, 586±595.
- Kidwell, J. L., Tomerlin, J. R., and Egan, S. K. (1995). *Theoretical Maximum Dietary Intake Calculations for Glyphosate*. Unpublished report, TAS, Inc., Washington, DC.
- Kier, L. D., Stegeman, S. D., Dudek, S., McAdams, J. G., Flowers, F. J., Huffman, M. B., and Heydens, W. F. (1997). Genotoxicity studies of glyphosate, alachlor and butachlor herbicide formulations. *Fundam. Appl. Toxicol.* **36**(No. 1, Part 2), 305.
- Kier, L. D., and Stegeman, S. D. (1993). *Mouse Micronucleus Assay of AMPA*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Killeen, J. C., Jr. (1975). *A Twenty-One Day Dermal Toxicity Study in Male Rabbits*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Kirkland, D. J., and Dean, S. W. (1994). On the need for confirmation of negative genotoxicity results in vitro and on the usefulness of mammalian cell mutation tests in a core battery: Experiences of a contract research laboratory. *Mutagenesis* **9**, 491±501.
- Knezevich, A. L. (1983). *A Chronic Feeding Study of Glyphosate (Roundup Technical) in Mice*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Kramer, R. M. (1978). *Herbicide Applicator Exposure to [Glyphosate] during Application of Roundup Herbicide and Field Re-entry*. Unpublished report, Monsanto Company, St. Louis, MO.
- Lankas, G. R. (1981). *A Lifetime Feeding Study of Glyphosate (Roundup Technical) in Rats*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Lavy, T. L., Cowell, J. E., Steinmetz, J. R., and Massey, J. H. (1992). Conifer seedling nursery worker exposure to glyphosate. *Arch. Environ. Contam. Toxicol.* **22**, 6±13.
- Li, A. P., and Long, T. J. (1988). An evaluation of the genotoxic potential of glyphosate. *Fundam. Appl. Toxicol.* **10**, 537±546.
- Lioi, M. B., Scarf, M. R., Santoro, A., Barbieri, R., Zeni, O., Salvemini, F., Di Berardino, D., and Ursini, M. V. (1998a). Cytogenetic damage and induction of pro-oxidant state in human lymphocytes exposed in vitro to glyphosate, vinclozolin, atrazine, and DPX-E9636. *Environ. Mol. Mutagen.* **32**, 39±46.
- Lioi, M. B., Scarf, M. R., Santoro, A., Barbieri, R., Zeni, O., Di Berardino, D., and Ursini, M. V. (1998b). Genotoxicity and oxidative stress induced by pesticide exposure in bovine lymphocyte cultures in vitro. *Mutat. Res.* **403**, 13±20.
- Lockett, M. F. (1965). Dangerous effects of isoprenaline in myocardial failure. *Lancet* **104**±106.
- Lorenz, M. G. (1994). *AMPA Analysis on EHL Glyphosate Samples*. Unpublished report, Monsanto Company, St. Louis, MO.
- Lundeh, J.-R., Westphal, D., Kieczka, H., Krebs, B., Locher-Bolz, S., Maasfeld, W., and Pick, E.-D. (1992). *Uniform Principles for Safeguarding the Health of Applicators of Plant Protection Products*. Paul Parey, Berlin/Hamburg.
- Maibach, H. I. (1986). Irritation, sensitization, photoirritation, and photosensitization assays with a glyphosate herbicide. *Contact Dermatitis* **15**, 152±156.
- Maibach, H. I. (1983). *Elimination of ¹⁴C-Glyphosate in Rhesus Monkeys Following a Single Dose: Percutaneous Absorption of ¹⁴C-Glyphosate in Roundup Formulation in Rhesus Monkeys Following a Single Topical Dose*. Unpublished report, University of California, School of Medicine, San Francisco, CA.
- Martin, A. D. (1990). A predictive model for the assessment of dermal exposure to pesticides. In *Proceedings of Prediction of Percutaneous Penetration* (R. C. Scott, R. Guy, and J. Hadgraft, Eds.). International Business Communications Technical Services, London.
- Martinez, T. T., and Brown, K. (1991). Oral and pulmonary toxicology of the surfactant used in Roundup herbicide. *Proc. West. Pharmacol. Soc.* **34**, 43±46.

- Menkes, D. B., Temple, W. A., and Edwards, I. R. (1991). Intentional self-poisoning with glyphosate-containing herbicides. *Hum. Exp. Toxicol.* **10**, 103±107.
- Moriya, M., Ohta, T., Watanabe, K., Miyazawa, T., Kato, K., and Shirasu, Y. (1983). Further mutagenicity studies on pesticides in bacterial reversion assay systems. *Mutat. Res.* **116**, 185±216.
- Morrissey, R. E., Schwetz, B. A., Lamb, J. C., IV, Ross, M. D., Teague, J. L., and Morris, R. W. (1988). Evaluation of rodent sperm, vaginal cytology, and reproductive organ weight data from National Toxicology Program 13-week studies. *Fundam. Appl. Toxicol.* **11**, 343±358.
- Naylor, M. W. (1988). *Dog GI Irritation Study with Roundup*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- NIOSH (1987). *Registry of Toxic Effects of Chemical Substances (1985±86 Edition)* (D. V. Sweet, Ed.). U.S. Department of Health and Human Services, Washington, DC.
- Njagi, G. D. E., and Gopalan, H. N. B. (1980). Mutagenicity testing of some selected food preservatives, herbicides and insecticides. II. Ames test. *Bangladesh J. Bot.* **9**, 141±146.
- Nordic Study Group on the Health Risk of Chromosomal Damage (1990). A Nordic database on somatic chromosomal damage in humans. *Mutat. Res.* **241**, 325±337.
- NRC (1983). *Risk Assessment in the Federal Government: Managing the Process*. National Research Council, Committee on the Institutional Means for Assessment of Risks to Public Health, Commission on Life Sciences, Natl. Acad. Press, Washington, DC.
- NRC (1993). *Pesticides in the Diets of Infants and Children*. Natl. Acad. Press, Washington, DC.
- NTP (1992). *Technical Report on Toxicity Studies of Glyphosate (CAS No. 1071-83-6) Administered in Dosed Feed to F344/N Rats and B6C3F₁ Mice*, Toxicity Report Series Number 16, NIH Publication 92-3135, July 1992. U.S. Department of Health and Human Services, National Toxicology Program (NTP), Research Triangle Park, NC.
- OECD (1998). *Ninth Addendum to the OECD Guidelines for the Testing of Chemicals*. Organisation for Economic Co-Operation and Development (OECD), Paris.
- Ogrowsky, D. (1989). *Four-Week Feeding Study of POEA in Sprague ± Dawley Rats*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Palmer, R. C., and Holman, I. P. (1997). *Soil and Hydrogeological Investigation of the Water Supply Source of Llanthony, Gwent, UK*. Unpublished report, Soil Survey and Land Research Centre, York, UK.
- Pease, W. S., Morello-Frosch, R. A., Albright, D. S., Kyle, A. D., and Robinson, J. C. (1993). *Preventing Pesticide-Related Illness in California Agriculture*. California Policy Seminar, University of California, Berkeley, CA.
- Peluso, M., Munia, A., Bolognesi, C., and Parodi, S. (1998). ³²P-postlabeling detection of DNA adducts in mice treated with the herbicide Roundup. *Environ. Mol. Mutagen.* **31**, 55±59.
- Petit, F., Le Goff, P., Cravedi, J.-P., Valotaire, Y., and Pakdel, F. (1997). Two complementary bioassays for screening the estrogenic potency of xenobiotics: Recombinant yeast for trout estrogen receptor and trout hepatocyte cultures. *J. Mol. Endocrinol.* **19**, 321±335.
- Rabbitts, T. H. (1994). Chromosomal translocations in human cancer. *Nature* **372**, 143±149.
- Randerath, K., Randerath, E., Agrawal, H. P., and Reddy, M. V. (1994). Biochemical (postlabeling) methods for analysis of carcinogen-DNA adducts. *IARC Sci. Pub.* **59**, 217±231.
- Randerath, E., Zhou, G.-D., and Randerath, K. (1997a). Organ specific oxidative DNA damage associated with normal birth in rats. *Carcinogenesis* **18**, 859±866.
- Randerath, K., Zhou, G.-D., Monk, S. A., and Randerath, E. (1997b). Enhanced levels in neonatal rat liver of 7,8-dihydro-8-oxo-2'-deoxyguanosine (8-hydroxydeoxyguanosine), a major mutagenic oxidative DNA lesion. *Carcinogenesis* **18**, 1419±1421.
- Rank, J., Jensen, A.-G., Skov, B., Pedersen, L. H., and Jensen, K. (1993). Genotoxicity testing of the herbicide Roundup and its active ingredient glyphosate isopropylamine using the mouse bone marrow micronucleus test, Salmonella mutagenicity test, and allium anaphase±telophase test. *Mutat. Res.* **300**, 29±36.
- Renwick, A. G., and Lazarus, N. R. (1998). Human variability and noncancer risk assessment: An analysis of the default uncertainty factor. *Regul. Toxicol. Pharmacol.* **27**, 3±20.
- Reyna, M. S. (1990). *Two Generation Reproduction Feeding Study with Glyphosate in Sprague±Dawley Rats*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Reyna, M. S., and Thake, D. C. (1983). *Six Month Study of Isopropylamine Salt of Glyphosate Administration by Gelatin Capsule to Beagle Dogs*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Reyna, M. S., and Ruecker, F. A. (1985). *Twelve Month Study of Glyphosate Administered by Gelatin Capsule to Beagle Dogs*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Richardson, G. M. (1997). *Compendium of Canadian Human Exposure Factors for Risk Assessment*. O'Connor Associates Environmental, Inc., Ottawa, Canada.
- Ridley, W. P., and Mirly, K. (1988). *The Metabolism of Glyphosate in Sprague±Dawley Rats. I. Excretion and Tissue Distribution of Glyphosate and Its Metabolites Following Intravenous and Oral Administration*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Rowe, L. D. (1987). *The Subacute Toxicity of Roundup Herbicide in Female Cattle*. Unpublished report, USDA, Veterinary Toxicology and Entomology Research Laboratory, Veterinary Toxicology Research Unit, College Station, TX.
- Roy, D. N., Konar, S. K., Banerjee, S., and Charles, D. A. (1989). Uptake and persistence of the herbicide glyphosate (Vision) in fruit of wild blueberry and red raspberry. *Can. J. Forest Res.* **19**, 842±847.
- Salamone, M. F., and Mavournin, K. H. (1994). Bone marrow micronucleus assay: A review of the mouse stocks used and their published mean spontaneous micronucleus frequencies. *Environ. Mol. Mutagen.* **23**, 239±273.
- Sawada, Y., Nagai, Y., Ueyama, M., and Yamamoto, I. (1988). Probable toxicity of surface-active agent in commercial herbicide containing glyphosate. *Lancet* **8580**, 299. [Letter]
- Schneyer, C. A. (1962). Salivary gland changes after isoproterenol-induced enlargement. *Am. J. Physiol.* **203**, 232±236.
- Schroeder, R. E. (1981). *A Three-Generation Reproduction Study with Glyphosate in Rats*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Shelanski, M. V. (1973). *Roundup Herbicide: Repeated Insult Patch Test in Humans*. Unpublished report, Shelanski Holding Company, Conshohocken, PA.
- Sherrick, S. L., Holt, H. A., and Hess, F. D. (1986). Absorption and translocation of MON 0818 adjuvant in field bindweed (*Convolvulus arvensis*). *Weed Sci.* **34**, 817±823.
- Shirasu, Y. (1980). *AMPA: Microbial Mutagenicity Study*. Unpublished report, The Institute of Environmental Toxicology, Toxicology Division, Kodaira, Japan.
- Shirasu, Y., Miriya, M., and Ota, T. (1978). *The Report of Mutagenic Study with Bacteria for CP67573 (ET78-241)*. Unpublished report, The Institute of Environmental Toxicology, Toxicology Division, Kodaira, Japan.

- Smith, L. W., and Foy, C. L. (1966). Penetration and distribution studies in bean, cotton, and barley from foliar and root applications of Tween 20-C¹⁴, fatty acid and oxyethylene labeled. *J. Agric. Food Chem.* **14**, 117±122.
- Smith, N. J., Martin, R. C., and St. Croix, R. G. (1996). Levels of the herbicide glyphosate in well water. *Bull. Environ. Contam. Toxicol.* **57**, 759±765.
- Solomon, E., Borrow, J., and Goddard, A. (1991). Chromosome aberrations and cancer. *Science* **254**, 1153±1160.
- Speth, T. F. (1993). Glyphosate removal from drinking water. *J. Environ. Eng.* **119**, 1139±1157.
- Sprankle, P., Meggitt, W. F., and Penner, D. (1975). Adsorption, mobility, and microbial degradation of glyphosate in the soil. *Weed Sci.* **23**, 229±234.
- Steber, J., and Wierich, P. (1987). Properties of aminotris (methylene phosphonate) affecting its environmental fate: Degradability, sludge adsorption, mobility in soils, and bioconcentration. *Chemosphere* **16**, 1323±1337.
- Stegeman, S. D., and Li, A. P. (1990). *Ames/Salmonella Mutagenicity Assay of POEA*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Stegeman, S. D., and Kier, L. D. (1998). *Mouse Micronucleus Screening Assay of POEA*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Steinmetz, J. R., and Goure, W. F. (1994). *Magnitude of Glyphosate Residues in Soybean Raw Agricultural Commodities (Year 1992)*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Stevens, J. T., Gfeller, W., Machemer, L., and Leist, K. H. (1998). Adequacy of required regulatory hazard testing for the detection of potential hormonal activity of crop protection chemicals. *J. Toxicol. Environ. Health B* **1**, 59±79.
- Stevens, J. T., Tobia, A., Lamb, J. C., IV, Tellone, C., and O'Neal, F. (1997). FIFRA Subdivision F testing guidelines: Are these tests adequate to detect potential hormonal activity for crop protection chemicals? *J. Toxicol. Environ. Health* **50**, 415±431.
- Stout, L. D., and Johnson, C. W. (1987). *90-Day Study of Glyphosate Administered in Feed to Sprague-Dawley Rats*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Stout, L. D., and Ruecker, F. A. (1990). *Chronic Study of Glyphosate Administered in Feed to Albino Rats*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Stout, L. D. (1990). *Ninety-Day Study of POEA Administered in Feed to Albino Rats*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Tai, T., Yamashita, M., and Wakimori, H. (1990). Hemodynamic effects of Roundup, glyphosate and surfactant in dogs. *Jpn. J. Toxicol.* **3**, 63±68.
- Takahashi, H. (1992). *Ammonium Salt of Glyphosate: General Pharmacological Study*. Unpublished report, The Institute of Environmental Toxicology, Tokyo, Japan.
- Talbot, A. R., Shiaw, M.-H., Huang, J.-S., Yang, S.-F., Goo, T.-S., Wang, S.-H., Chen, C.-L., and Sanford, T. R. (1991). Acute poisoning with a glyphosate-surfactant herbicide ('Round-up'): A review of 93 cases. *Hum. Exp. Toxicol.* **10**, 1±8.
- Tasker, E. J. (1980a). *Teratology Study in Rats*. Unpublished report, International Research and Development Corporation, Mattawan, MI.
- Tasker, E. J. (1980b). *Teratology Study in Rabbits*. Unpublished report, International Research and Development Corporation, Mattawan, MI.
- Temple, W. A., and Smith, N. A. (1992). Glyphosate herbicide poisoning experience in New Zealand. *N. Zeal. Med. J.* **105**, 173±174.
- Tennant, R. W., Margolin, B. H., Shelby, M. D., Zeiger, E., Haseman, J. K., Spalding, J., Caspary, W., Resnick, M., Stasiewicz, S., Anderson, B., and Minor, R. (1987). Prediction of chemical carcinogenicity in rodents from in vitro genetic toxicity assays. *Science* **236**, 933±941.
- Tierney, W. J. (1979). *A Three Month Feeding Study of Glyphosate (Roundup Technical) in Mice*. Unpublished report, Bio/Dynamics, Inc., East Millstone, NJ.
- Tominack, R. L., Conner, P., and Yamashita, M. (1989). Clinical management of Roundup herbicide exposure. *Jpn. J. Toxicol.* **2**, 187±192.
- Tominack, R. L., Yang, G.-Y., Tsai, W.-J., Chung, H.-M., and Deng, J.-F. (1991). Taiwan National Poison Center survey of glyphosate-surfactant herbicide ingestions. *Clin. Toxicol.* **29**, 91±109.
- Tompkins, E. C. (1991). *90-Day Oral (Capsule) Toxicity Study in Dogs With AMPA*. Unpublished report, WIL Research Laboratories, Inc., Ashland, OH.
- Tucker, J. D., and Preston, R. J. (1996). Chromosomal aberrations, micronuclei, aneuploidy, sister chromatid exchanges, and cancer risk assessment. *Mutat. Res.* **365**, 147±159.
- U.S. Environmental Protection Agency (1988). *Superfund Exposure Assessment Manual (PB89-135859)*. U.S. Environmental Protection Agency, Washington, DC.
- U.S. Environmental Protection Agency (1991). Guidelines for developmental toxicity risk assessment (FRL-4038-3). *Fed. Reg.* **56**, 63798±63826.
- U.S. Environmental Protection Agency (1992a). Pesticide tolerance proposed rule. *Fed. Reg.* **57**, 8739±8740.
- U.S. Environmental Protection Agency (1992b). *Drinking Water Criteria Document for Glyphosate*, PB92-173392. U.S. Environmental Protection Agency, Health and Ecological Criteria Division, Office of Science and Technology, Office of Water, Washington, DC.
- U.S. Environmental Protection Agency (1992c). *Dermal Exposure Assessment: Principles and Applications*, Interim Report, U. S. EPA/600/8-91/011B. U.S. Environmental Protection Agency, Office of Health and Environmental Assessment, Washington, DC.
- U.S. Environmental Protection Agency (1993). *Re-registration Eligibility Decision (RED): Glyphosate*. U.S. Environmental Protection Agency, Office of Prevention, Pesticides and Toxic Substances, Washington, DC.
- U.S. Environmental Protection Agency (1995). *Ecological Levels of Concern: A Comparative Analysis*. U.S. Environmental Protection Agency, Office of Pesticide Programs, Washington DC.
- U.S. Environmental Protection Agency (1996). *Proposed Guidelines for Carcinogen Risk Assessment*, EPA/600/P-92/003C. Office of Research and Development, U.S. Environmental Protection Agency, Washington, DC.
- U.S. Environmental Protection Agency (1997a). Pesticide tolerance final rule. *Fed. Reg.* **62**, 17723±17730.
- U.S. Environmental Protection Agency (1997b). Glyphosate: Tolerances for residues. In *Code of Federal Regulations*, Title 40, Part 180.364 (a). U.S. Govt. Printing Office, Washington, DC.
- U.S. Environmental Protection Agency (1997c). *Exposure Factors Handbook*, U.S. EPA/600/P-95/002Fa. Office of Research and Development, U.S. Environmental Protection Agency, Washington, DC.
- U.S. Environmental Protection Agency (1998a). Glyphosate: Pesticide tolerance, Final Rule 40 CFR, Part 180 [OPP-300736; FRL 6036-1]. *Fed. Reg.* **63**(195), 54058±54066.
- U.S. Environmental Protection Agency (1998b). *Endocrine Disruptor Screening and Testing Advisory Committee (ECSTAC) Final Report, August 1998*. U.S. Environmental Protection Agency, Washington, DC.

- van de Waart, I. E. J. (1995). *Evaluation of the Ability of Glyfosaat to Induce Chromosome Aberrations in Cultured Peripheral Human Lymphocytes*. Unpublished report, NOTOX, The Netherlands.
- Van Ginkel, C. G., Stroo, C. A., and Kroon, A. G. M. (1993). Biodegradability of ethoxylated fatty amines: Detoxification through central cession of these surfactants. *Sci. Tot. Environ. Suppl. Proc. Second Eur. Conf. Ecotoxicol.* **Part 1**, 689±697.
- Velasquez, D. J. (1983a). *Acute Inhalation Toxicity of Roundup Formulation to Male and Female Sprague-Dawley Rats*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Velasquez, D. J. (1983b). *Four-Week Study of 33-1/3% Use-Dilution of Roundup in Water Administered to Male and Female Sprague-Dawley Rats by Inhalation*. Unpublished report, Monsanto Environmental Health Laboratory, St. Louis, MO.
- Vigfusson, N. V., and Vyse, E. R. (1980). The effect of the pesticides, dexton, captan and Roundup, on sister-chromatid exchanges in human lymphocytes in vitro. *Mutat. Res.* **79**, 53±57.
- Wester, R. C., Melendres, J., Sarason, R., McMaster, J., and Maibach, H. I. (1991). Glyphosate skin binding, absorption, residual tissue distribution, and skin decontamination. *Fundam. Appl. Toxicol.* **16**, 725±732.
- WHO (1967). *Procedures for Investigating Intentional and Unintentional Food Additives*, WHO Technical Report Series No. 348. Report of a WHO Scientific Group, Geneva, World Health Organization.
- WHO (1990). *Principles for the Toxicological Assessment of Pesticide Residues in Food IPCS: Environmental Health Criteria 104*, pp. 76±80. World Health Organization, Geneva.
- WHO (1994a). *Glyphosate. Environmental Health Criteria No. 159*. World Health Organization, Geneva.
- WHO (1994b). *Assessing Human Health Risks of Chemicals: Derivation of Guidance Values for Health-Based Exposure Limits IPCS: Environmental Health Criteria 170*, pp. 27±31. World Health Organization, Geneva.
- WHO (1997). *Guidelines for Predicting Dietary Intake of Pesticide Residues*. Joint UNEP/FAO/WHO Food Contamination Monitoring Programme, World Health Organization, Geneva.
- Wildeman, A. G., and Nazar, R. N. (1982). Significance of plant metabolism in the mutagenicity and toxicity of pesticides. *Can. J. Genet. Cytol.* **24**, 437±449.
- Williams, G. M. (1989). Methods for evaluating chemical genotoxicity. *Annu. Rev. Pharmacol. Toxicol.* **29**, 189±211.
- Williams, G. M., Mori, H., and McQueen, C. A. (1989). Structure-activity relationships in the rat hepatocyte DNA-repair test for 300 chemicals. *Mutat. Res.* **221**, 263±286.
- Williams, J., Gladen, B. C., Schrader, S. M., Turner, T. W., Phelps, J. L., and Chapin, R. E. (1990). Semen analysis and fertility assessment in rabbits: Statistical power and design considerations for toxicology studies. *Fundam. Appl. Toxicol.* **15**, 651±665.
- Wrenn, J. (1980). *Dominant Lethal Study in Mice*. Unpublished report, International Research and Development Corporation, Mattawan, MI.
- Yousef, M. I., Salem, M. H., Ibrahim, H. Z., Helmi, S., Seehy, M. A., and Bertheussen, K. (1995). Toxic effects of carbofuran and glyphosate on semen characteristics in rabbits. *J. Environ. Sci. Health B30*, 513±534.
- Zeiger, E., Haseman, J. K., Shelby, M. D., Margolin, B. H., and Tennant, R. W. (1990). Evaluation of four in vitro genetic toxicity tests for predicting rodent carcinogenicity: Confirmation of earlier results with 41 additional chemicals. *Environ. Mol. Mutagen.* **16** (Suppl. 18), 1±14.

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; OPP HED Notes Coordinators[OPP_HED_Notes_Coordinators@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]; Woo, Yintak[Woo.Yintak@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Morton, Thurston[Morton.Thurston@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/9/2015 5:58:01 PM
Subject: Glyphosate CARC Package

The Glyphosate CARC package is now on the Lotus Notes database.

Please let me know if you cannot access it and I will email you the documents.

REMINDER: the Glyphosate CARC meeting is an **ALL-DAY** meeting (9:00 am to 4:00 pm) next **Wednesday, September 16, 2015**, in room S-10100.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

To: Townsend, Barbara[Townsend.Barbara@epa.gov]
From: Wood, Charles
Sent: Thur 9/10/2015 4:43:48 PM
Subject: CARC meeting location

Hi Barbara,

I will be attending a meeting of the EPA Cancer Assessment Review Committee (Glyphosate Review) from 9am to 4pm on Wednesday, September 16, 2015. Here is location:

Room S-10100

Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

Let me know if you need anything else.

--Charles

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]
From: Wood, Charles
Sent: Thur 9/10/2015 1:08:50 PM
Subject: RE: Glyphosate DERs and Support Docs: Part 1 of 2

Thanks, Lori. Sorry for the trouble!

--Charles

From: Brunsman, Lori
Sent: Thursday, September 10, 2015 8:26 AM
To: Wood, Charles
Subject: Glyphosate DERs and Support Docs: Part 1 of 2

Charles –

There are a LOT of documents in the Glyphosate CARC package. I will send them to you in multiple emails.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

“When you have more than you need, build a longer table, not a higher fence.”

From: Wood, Charles
Sent: Wednesday, September 09, 2015 3:08 PM
To: Brunsman, Lori
Subject: RE: Glyphosate CARC Package

Hi Lori,

Can you email me the package?

--Charles

From: Brunsman, Lori
Sent: Wednesday, September 09, 2015 1:58 PM
To: Akerman, Gregory; Brunsman, Lori; Chen, Jonathan; Dunbar, Anwar; Kent, Ray; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Middleton, Karlyn; OPP HED Notes Coordinators; Rowland, Jess; Shah, Pv; Woo, Yintak; Wood, Charles; Lobdell, Danelle; Morton, Thurston; Smith, Charles
Subject: Glyphosate CARC Package

The Glyphosate CARC package is now on the Lotus Notes database.

Please let me know if you cannot access it and I will email you the documents.

REMINDER: the Glyphosate CARC meeting is an **ALL-DAY** meeting (9:00 am to 4:00 pm) next **Wednesday, September 16, 2015**, in room S-10100.

Have a great day!

Lori

*Lori Brunsman, Statistician and Project Officer
Science Information Management Branch*

*Health Effects Division
Office of Pesticide Programs*

Office of Chemical Safety and Pollution Prevention

*Environmental Protection Agency
One Potomac Yard S-10934*

*brunsman.lori@epa.gov
703-308-2902*

"When you have more than you need, build a longer table, not a higher fence."

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]
From: Wood, Charles
Sent: Wed 9/9/2015 7:08:04 PM
Subject: RE: Glyphosate CARC Package

Hi Lori,

Can you email me the package?

--Charles

From: Brunsman, Lori
Sent: Wednesday, September 09, 2015 1:58 PM
To: Akerman, Gregory; Brunsman, Lori; Chen, Jonathan; Dunbar, Anwar; Kent, Ray; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Middleton, Karlyn; OPP HED Notes Coordinators; Rowland, Jess; Shah, Pv; Woo, Yintak; Wood, Charles; Lobdell, Danelle; Morton, Thurston; Smith, Charles
Subject: Glyphosate CARC Package

The Glyphosate CARC package is now on the Lotus Notes database.

Please let me know if you cannot access it and I will email you the documents.

REMINDER: the Glyphosate CARC meeting is an **ALL-DAY** meeting (9:00 am to 4:00 pm) next **Wednesday, September 16, 2015**, in room S-10100.

Have a great day!

Lori

*Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs*

Office of Chemical Safety and Pollution Prevention

*Environmental Protection Agency
One Potomac Yard S-10934*

*brunsman.lori@epa.gov
703-308-2902*

"When you have more than you need, build a longer table, not a higher fence."

From: Wood, Charles
Location: 10621
Importance: Normal
Subject: Accepted: Glyphosate - CARC - Continues.....
Start Date/Time: Wed 9/16/2015 5:00:00 PM
End Date/Time: Wed 9/16/2015 8:00:00 PM

From: Wood, Charles
Location: 10100
Importance: Normal
Subject: Accepted: Glyphosate - CARC
Start Date/Time: Wed 9/16/2015 1:00:00 PM
End Date/Time: Wed 9/16/2015 4:00:00 PM

To: Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]
Cc: Brunsman, Lori[Brunsmann.Lori@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]
From: Liccione, John
Sent: Thur 9/24/2015 11:49:26 AM
Subject: RE: Glyphosate CARC Report

It happened to me too.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:27 AM
To: Rowland, Jess
Cc: Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher; Akerman, Gregory
Subject: RE: Glyphosate CARC Report

Hi all,

For some reason, I can't upload my comments to share point. It says that its locked for editing for me. Did this happen to anyone else?

From: Rowland, Jess
Sent: Tuesday, September 22, 2015 2:01 PM
To: Akerman, Gregory; Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher
Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the “document makeover”

Concentrate on the science

Make this as your priority and your “home pope work” on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Rowland, Jess[Rowland.Jess@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; May, Brenda[May.Brenda@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Powell, Calvin[Powell.Calvin@epa.gov]
From: Brunzman, Lori
Sent: Wed 9/23/2015 4:24:24 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I just posted CPR's version to the CARC Discussion database.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunzman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Rowland, Jess
Sent: Wednesday, September 23, 2015 12:18 PM
To: Akerman, Gregory; Brunzman, Lori; Kent, Ray; McCarroll, Nancy; Middleton, Karlyn; May, Brenda; Dunbar, Anwar; Akerman, Gregory; Powell, Calvin
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Ok. This is turning into a CF.
Lori u have rights to CARC discussion db.
Please post CPRs version.
Every one make your edits in track changes. I am in Friday. I will collate and revise the documents.
Lori if you don't have rights, Jessica you post it

Sent from my Windows Phone

From: [Akerman, Gregory](#)

Sent: 9/23/2015 12:03 PM

To: [Rowland, Jess](#)

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe Jessica should just post the version that Cal formatted (he already sent it to her) and we can make edits using track changes as we normally do. I will help pull all the edits together tomorrow.

From: Rowland, Jess

Sent: Wednesday, September 23, 2015 11:51 AM

To: [Brunsman, Lori](#); [Kidwell, Jessica](#); [Middleton, Karlyn](#); [Akerman, Gregory](#); [Lobdell, Danelle](#); [Chen, Jonathan](#); [Liccione, John](#); [Wood, Charles](#); [Dunbar, Anwar](#); [Kent, Ray](#); [McCarroll, Nancy](#)

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

At home it should be called share pointless ☐. Another crown • of OEI

Sent from my Windows Phone

From: [Brunsman, Lori](#)

Sent: 9/23/2015 11:48 AM

To: [Kidwell, Jessica](#); [Middleton, Karlyn](#); [Akerman, Gregory](#); [Lobdell, Danelle](#); [Chen, Jonathan](#); [Liccione, John](#); [Wood, Charles](#); [Dunbar, Anwar](#); [Rowland, Jess](#); [Kent, Ray](#); [McCarroll, Nancy](#)

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

*Environmental Protection Agency
One Potomac Yard S-10934*

*brunsman.lori@epa.gov
703-308-2902*

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

**Open Glyphosate CARC Final
9.21.15_cpr_JMK.docx**

Followthis document to get updates in your newsfeed.

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; May, Brenda[May.Brenda@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Powell, Calvin[Powell.Calvin@epa.gov]
From: Rowland, Jess
Sent: Wed 9/23/2015 4:18:13 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Ok. This is turning into a CF.
Lori u have rights to CARC discussion db.
Please post CPRs version.
Every one make your edits in track changes. I am in Friday. I will collate and revise the documents.
Lori if you don't have rights, Jessica you post it

Sent from my Windows Phone

From: Akerman, Gregory
Sent: 9/23/2015 12:03 PM
To: Rowland, Jess
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe Jessica should just post the version that Cal formatted (he already sent it to her) and we can make edits using track changes as we normally do. I will help pull all the edits together tomorrow.

From: Rowland, Jess
Sent: Wednesday, September 23, 2015 11:51 AM
To: Brunsman, Lori; Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

At home it should be called share pointless □. Another crown • of OEI

Sent from my Windows Phone

From: Brunsman, Lori
Sent: 9/23/2015 11:48 AM
To: Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunsman.lori@epa.gov

703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:48 AM

To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn

Sent: Wednesday, September 23, 2015 11:47 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open [Glyphosate CARC Final 9.21.15_cpr_JMK.docx](#)

[Follow](#)this document to get updates in your newsfeed.

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Rowland, Jess
Sent: Wed 9/23/2015 3:51:20 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

At home it should be called share pointless ☹. Another crown ☹ of OEI

Sent from my Windows Phone

From: Brunsmann, Lori
Sent: 9/23/2015 11:48 AM
To: Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is

Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open Glyphosate CARC Final
9.21.15 cpr JMK.docx

Followthis document to get updates in your newsfeed.

To: Kidwell, Jessica[kidwell.jessica@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Middleton, Karlyn
Sent: Wed 9/23/2015 3:51:08 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I'll use Cal's version.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

**Open Glyphosate CARC Final
9.21.15_cpr_JMK.docx**

Followthis document to get updates in your newsfeed.

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Kidwell, Jessica
Sent: Wed 9/23/2015 3:50:34 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Then it's not working there either.

From: Brunsman, Lori
Sent: Wednesday, September 23, 2015 11:50 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

No green circle here, either.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:48 AM

To: Brunzman, Lori; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

You get the green circle when you save it?

From: Brunzman, Lori

Sent: Wednesday, September 23, 2015 11:48 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

It works for me here at the office.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunzman.lori@epa.gov

703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:46 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan;

Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open **Glyphosate CARC Final**
9.21.15_cpr_JMK.docx

Followthis document to get updates in your newsfeed.

To: Kidwell, Jessica[kidwell.jessica@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Brunzman, Lori
Sent: Wed 9/23/2015 3:50:02 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

No green circle here, either.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunzman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Brunzman, Lori; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

You get the green circle when you save it?

From: Brunzman, Lori

Sent: Wednesday, September 23, 2015 11:48 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

It works for me here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunsman.lori@epa.gov

703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:46 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open **Glyphosate CARC Final**
9.21.15_cpr_JMK.docx

Followthis document to get updates in your newsfeed.

To: Kidwell, Jessica[kidwell.jessica@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Middleton, Karlyn
Sent: Wed 9/23/2015 3:49:05 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

No circle.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Brunsman, Lori; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

You get the green circle when you save it?

From: Brunsman, Lori
Sent: Wednesday, September 23, 2015 11:48 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

It works for me here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open **Glyphosate CARC Final 9.21.15_cpr_JMK.docx**

Followthis document to get updates in your newsfeed.

To: Kidwell, Jessica[kidwell.jessica@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Brunzman, Lori
Sent: Wed 9/23/2015 3:48:27 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunzman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open Glyphosate CARC Final 9.21.15_cpr_JMK.docx

Followthis document to get updates in your newsfeed.

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Kidwell, Jessica
Sent: Wed 9/23/2015 3:48:21 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

You get the green circle when you save it?

From: Brunsman, Lori
Sent: Wednesday, September 23, 2015 11:48 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

It works for me here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:46 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open [Glyphosate CARC Final 9.21.15_cpr_JMK.docx](#)

Followthis document to get updates in your newsfeed.

To: Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Kidwell, Jessica
Sent: Wed 9/23/2015 3:47:48 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open Glyphosate CARC Final
9.21.15 cpr JMK.docx

Followthis document to get updates in your newsfeed.

To: Kidwell, Jessica[kidwell.jessica@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/23/2015 3:47:36 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

It works for me here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open **Glyphosate CARC Final**
9.21.15_cpr_JMK.docx

Followthis document to get updates in your newsfeed.

To: Kidwell, Jessica[kidwell.jessica@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Brunsman, Lori[Brunsmann.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Middleton, Karlyn
Sent: Wed 9/23/2015 3:46:58 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open Glyphosate CARC Final
9.21.15_cpr_JMK.docx

Followthis document to get updates in your newsfeed.

To: Kidwell, Jessica[kidwell.jessica@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Kidwell, Jessica
Sent: Wed 9/23/2015 3:46:04 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open **Glyphosate CARC Final 9.21.15_cpr_JMK.docx**

Followthis document to get updates in your newsfeed.

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov];
Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione,
John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Middleton,
Karlyn[Middleton.Karlyn@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland,
Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll,
Nancy[McCarroll.Nancy@epa.gov]
Cc: Kidwell, Jessica[kidwell.jessica@epa.gov]
From: Kidwell, Jessica
Sent: Wed 9/23/2015 3:43:04 PM
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has
Cal's formatting edits. Please share this with anyone I missed on
CARC.

Open Glyphosate CARC Final 9.21.15_cpr_JMK.docx

Followthis document to get updates in your newsfeed.

To: Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]
Cc: Brunsman, Lori[Brunsman.Lori@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]
From: Kidwell, Jessica
Sent: Wed 9/23/2015 3:30:16 PM
Subject: RE: Glyphosate CARC tReport

Yes, Greg and I can't either. I'm actually using Cal's version since he made formatting edits instead of the file on the share drive that Lori's referring to. Do you want me to share this file?

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:27 AM
To: Rowland, Jess
Cc: Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher; Akerman, Gregory
Subject: RE: Glyphosate CARC Report

Hi all,

For some reason, I can't upload my comments to share point. It says that its locked for editing for me. Did this happen to anyone else?

From: Rowland, Jess
Sent: Tuesday, September 22, 2015 2:01 PM
To: Akerman, Gregory; Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher
Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the “document makeover”

Concentrate on the science

Make this as your priority and your “home pope work” on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]
Cc: Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/23/2015 3:28:34 PM
Subject: RE: Glyphosate CARC Report

I know both Jessica and Greg were having problems accessing the Sharepoint site, too. I downloaded the document and sent it to them via email.

Have a great day!

Lori

*Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs*

Office of Chemical Safety and Pollution Prevention

*Environmental Protection Agency
One Potomac Yard S-10934*

*brunsman.lori@epa.gov
703-308-2902*

"When you have more than you need, build a longer table, not a higher fence."

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:27 AM
To: Rowland, Jess
Cc: Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher; Akerman, Gregory
Subject: RE: Glyphosate CARC Report

Hi all,

For some reason, I can't upload my comments to share point. It says that its locked for editing for me. Did this happen to anyone else?

From: Rowland, Jess

Sent: Tuesday, September 22, 2015 2:01 PM

To: Akerman, Gregory; Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher

Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the "document makeover"

Concentrate on the science

Make this as your priority and your "home pope work" on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Rowland, Jess[Rowland.Jess@epa.gov]
Cc: Brunsman, Lori[Brunsmann.Lori@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]
From: Middleton, Karlyn
Sent: Wed 9/23/2015 3:26:51 PM
Subject: RE: Glyphosate CARC Report

Hi all,

For some reason, I can't upload my comments to share point. It says that its locked for editing for me. Did this happen to anyone else?

From: Rowland, Jess
Sent: Tuesday, September 22, 2015 2:01 PM
To: Akerman, Gregory; Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher
Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the "document makeover"

Concentrate on the science

Make this as your priority and your "home pope work" on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Brunzman, Lori[Brunzman.Lori@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]
From: Rowland, Jess
Sent: Tue 9/22/2015 6:01:09 PM
Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the “document makeover”

Concentrate on the science

Make this as your priority and your “home pope work” on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov];
Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent,
Ray[Kent.Ray@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll,
Nancy[McCarroll.Nancy@epa.gov]; May, Brenda[May.Brenda@epa.gov]; Middleton,
Karlyn[Middleton.Karlyn@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Schlosser,
Christopher[Schlosser.Christopher@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Woo,
Yintak[Woo.Yintak@epa.gov]
Cc: Rowland, Jess[Rowland.Jess@epa.gov]
From: Rowland, Jess
Sent: Tue 9/22/2015 5:43:19 PM
Subject: Rowland, Jess has shared 'Glyphosate CARC Final 9.21.15'

Here's the document that Rowland, Jess shared with you.

Open Glyphosate CARC Final 9.21.15.docx

Followthis document to get updates in your newsfeed.

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; May, Brenda[May.Brenda@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Powell, Calvin[Powell.Calvin@epa.gov]
From: Rowland, Jess
Sent: Wed 9/23/2015 4:18:13 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Ok. This is turning into a CF.
Lori u have rights to CARC discussion db.
Please post CPRs version.
Every one make your edits in track changes. I am in Friday. I will collate and revise the documents.
Lori if you don't have rights, Jessica you post it

Sent from my Windows Phone

From: Akerman, Gregory
Sent: 9/23/2015 12:03 PM
To: Rowland, Jess
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe Jessica should just post the version that Cal formatted (he already sent it to her) and we can make edits using track changes as we normally do. I will help pull all the edits together tomorrow.

From: Rowland, Jess
Sent: Wednesday, September 23, 2015 11:51 AM
To: Brunsman, Lori; Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

At home it should be called share pointless □. Another crown • of OEI

Sent from my Windows Phone

From: Brunsman, Lori
Sent: 9/23/2015 11:48 AM
To: Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunzman.lori@epa.gov

703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:48 AM

To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn

Sent: Wednesday, September 23, 2015 11:47 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:46 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

**Open Glyphosate CARC Final
9.21.15_cpr_JMK.docx**

Followthis document to get updates in your newsfeed.

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Rowland, Jess
Sent: Wed 9/23/2015 3:51:20 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

At home it should be called share pointless ☹. Another crown ☹ of OEI

Sent from my Windows Phone

From: Brunsmann, Lori
Sent: 9/23/2015 11:48 AM
To: Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is

Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open Glyphosate CARC Final
9.21.15 cpr JMK.docx

Followthis document to get updates in your newsfeed.

To: Kidwell, Jessica[kidwell.jessica@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Middleton, Karlyn
Sent: Wed 9/23/2015 3:51:08 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I'll use Cal's version.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

**Open Glyphosate CARC Final
9.21.15_cpr_JMK.docx**

Followthis document to get updates in your newsfeed.

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Kidwell, Jessica
Sent: Wed 9/23/2015 3:50:34 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Then it's not working there either.

From: Brunsman, Lori
Sent: Wednesday, September 23, 2015 11:50 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

No green circle here, either.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:48 AM

To: Brunzman, Lori; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

You get the green circle when you save it?

From: Brunzman, Lori

Sent: Wednesday, September 23, 2015 11:48 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

It works for me here at the office.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunzman.lori@epa.gov

703-308-2902

“When you have more than you need, build a longer table, not a higher fence.”

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:46 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan;

Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open **Glyphosate CARC Final**
9.21.15_cpr_JMK.docx

Followthis document to get updates in your newsfeed.

To: Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]
Cc: Brunsman, Lori[Brunsman.Lori@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]
From: Kidwell, Jessica
Sent: Wed 9/23/2015 3:30:16 PM
Subject: RE: Glyphosate CARC tReport

Yes, Greg and I can't either. I'm actually using Cal's version since he made formatting edits instead of the file on the share drive that Lori's referring to. Do you want me to share this file?

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:27 AM
To: Rowland, Jess
Cc: Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher; Akerman, Gregory
Subject: RE: Glyphosate CARC Report

Hi all,

For some reason, I can't upload my comments to share point. It says that its locked for editing for me. Did this happen to anyone else?

From: Rowland, Jess
Sent: Tuesday, September 22, 2015 2:01 PM
To: Akerman, Gregory; Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher
Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the “document makeover”

Concentrate on the science

Make this as your priority and your “home pope work” on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]
Cc: Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/23/2015 3:28:34 PM
Subject: RE: Glyphosate CARC Report

I know both Jessica and Greg were having problems accessing the Sharepoint site, too. I downloaded the document and sent it to them via email.

Have a great day!

Lori

*Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs*

Office of Chemical Safety and Pollution Prevention

*Environmental Protection Agency
One Potomac Yard S-10934*

*brunsman.lori@epa.gov
703-308-2902*

"When you have more than you need, build a longer table, not a higher fence."

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:27 AM
To: Rowland, Jess
Cc: Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher; Akerman, Gregory
Subject: RE: Glyphosate CARC Report

Hi all,

For some reason, I can't upload my comments to share point. It says that its locked for editing for me. Did this happen to anyone else?

From: Rowland, Jess

Sent: Tuesday, September 22, 2015 2:01 PM

To: Akerman, Gregory; Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher

Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the "document makeover"

Concentrate on the science

Make this as your priority and your "home pope work" on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Rowland, Jess[Rowland.Jess@epa.gov]
Cc: Brunsman, Lori[Brunsmann.Lori@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]
From: Middleton, Karlyn
Sent: Wed 9/23/2015 3:26:51 PM
Subject: RE: Glyphosate CARC Report

Hi all,

For some reason, I can't upload my comments to share point. It says that its locked for editing for me. Did this happen to anyone else?

From: Rowland, Jess
Sent: Tuesday, September 22, 2015 2:01 PM
To: Akerman, Gregory; Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher
Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the "document makeover"

Concentrate on the science

Make this as your priority and your "home pope work" on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]
From: Rowland, Jess
Sent: Tue 9/22/2015 6:01:09 PM
Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the “document makeover”

Concentrate on the science

Make this as your priority and your “home pope work” on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov];
Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent,
Ray[Kent.Ray@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll,
Nancy[McCarroll.Nancy@epa.gov]; May, Brenda[May.Brenda@epa.gov]; Middleton,
Karlyn[Middleton.Karlyn@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Schlosser,
Christopher[Schlosser.Christopher@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Woo,
Yintak[Woo.Yintak@epa.gov]
Cc: Rowland, Jess[Rowland.Jess@epa.gov]
From: Rowland, Jess
Sent: Tue 9/22/2015 5:43:19 PM
Subject: Rowland, Jess has shared 'Glyphosate CARC Final 9.21.15'

Here's the document that Rowland, Jess shared with you.

Open Glyphosate CARC Final 9.21.15.docx

Followthis document to get updates in your newsfeed.

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; OPP HED Notes Coordinators[OPP_HED_Notes_Coordinators@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]; Woo, Yintak[Woo.Yintak@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Morton, Thurston[Morton.Thurston@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/9/2015 5:58:01 PM
Subject: Glyphosate CARC Package

The Glyphosate CARC package is now on the Lotus Notes database.

Please let me know if you cannot access it and I will email you the documents.

REMINDER: the Glyphosate CARC meeting is an **ALL-DAY** meeting (9:00 am to 4:00 pm) next **Wednesday, September 16, 2015**, in room S-10100.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Brunsman, Lori

Required Attendees: OPP HED CARC; Christensen, Carol; Sarkar, Bayazid; Shah, Aruna; Tao, Jenny; Schlosser, Christopher; Miller, David; Lobdell, Danelle; Wood, Charles

Optional Attendees: Kidwell, Jessica; Kent, Ray; Liccione, John; Middleton, Karlyn; Rowland, Jess; McCarroll, Nancy; Akerman, Gregory; Smith, Charles; Dunbar, Anwar; Shah, Pv

Location: DCRoomPYS10100/Potomac-Yard-One

Importance: High

Subject: Canceled: Glyphosate CARC Meeting

Start Date/Time: Wed 7/8/2015 2:30:00 PM

End Date/Time: Wed 7/8/2015 4:30:00 PM

NOTE: The Glyphosate CARC meeting has been rescheduled for July 8th.

To: OPP HED CARC[OPP_HED_CARC@epa.gov]; Christensen, Carol[Christensen.Carol@epa.gov]; Sarkar, Bayazid[Sarkar.Bayazid@epa.gov]; Shah, Aruna[Shah.Aruna@epa.gov]; Tao, Jenny[Tao.Jenny@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Miller, David[Miller.DavidJ@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]
Cc: Kidwell, Jessica[kidwell.jessica@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]
From: Brunsman, Lori
Sent: Tue 5/26/2015 1:25:29 PM
Subject: Glyphosate CARC Meeting

We are considering moving the CARC meeting on Glyphosate from June 24th to July 8th. Please let me know ASAP if you CANNOT make the July 8th meeting date.

Thanks!

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

To: Akerman, Gregory[Akerman.Gregory@epa.gov]
From: Rowland, Jess
Sent: Tue 5/12/2015 1:49:01 PM
Subject: Couple

If Amy available Thursday....book her
You and I meet with karlyn on Glyphosate carc...tomorrow or Thursday
Thanks
Sent from my Windows Phone

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; OPP HED Notes Coordinators[OPP_HED_Notes_Coordinators@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]; Woo, Yintak[Woo.Yintak@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Morton, Thurston[Morton.Thurston@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/9/2015 5:58:01 PM
Subject: Glyphosate CARC Package

The Glyphosate CARC package is now on the Lotus Notes database.

Please let me know if you cannot access it and I will email you the documents.

REMINDER: the Glyphosate CARC meeting is an **ALL-DAY** meeting (9:00 am to 4:00 pm) next **Wednesday, September 16, 2015**, in room S-10100.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Rowland, Jess

Required Attendees: akerman.gregory@epa.gov; Lori Brunsman; Chen, Jonathan; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Shah, Pv; Kent, Ray; Lobdell, Danelle; Woo, Yintak; Wood, Charles; Morton, Thurston

Location: 10621

Importance: Normal

Subject: Glyphosate - CARC - Continues.....

Start Date/Time: Wed 9/16/2015 5:00:00 PM

End Date/Time: Wed 9/16/2015 8:00:00 PM

Given the volume of data we have to review, I have scheduled this PM session.

This CARC should be a priority for you. So keep this day OPEN

Please adjust your other commitments for the day

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; OPP HED CARC[OPP_HED_CARC@epa.gov]; Christensen, Carol[Christensen.Carol@epa.gov]; Sarkar, Bayazid[Sarkar.Bayazid@epa.gov]; Shah, Aruna[Shah.Aruna@epa.gov]; Tao, Jenny[Tao.Jenny@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Miller, David[Miller.DavidJ@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]
Cc: Kidwell, Jessica[kidwell.jessica@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]
From: Chen, Jonathan
Sent: Tue 5/26/2015 1:55:50 PM
Subject: RE: Glyphosate CARC Meeting

July 8th is good for me.

Jonathan Chen

Jonathan Chen

From: Brunsman, Lori
Sent: Tuesday, May 26, 2015 9:25 AM
To: OPP HED CARC; Christensen, Carol; Sarkar, Bayazid; Shah, Aruna; Tao, Jenny; Schlosser, Christopher; Miller, David; Lobdell, Danelle; Wood, Charles
Cc: Kidwell, Jessica; Kent, Ray; Liccione, John; Middleton, Karlyn; Rowland, Jess; McCarroll, Nancy; Akerman, Gregory; Smith, Charles; Dunbar, Anwar; Shah, Pv
Subject: Glyphosate CARC Meeting

We are considering moving the CARC meeting on Glyphosate from June 24th to July 8th. Please let me know ASAP if you CANNOT make the July 8th meeting date.

Thanks!

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunzman.lori@epa.gov

703-308-2902

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; OPP HED CARC[OPP_HED_CARC@epa.gov]; Christensen, Carol[Christensen.Carol@epa.gov]; Sarkar, Bayazid[Sarkar.Bayazid@epa.gov]; Shah, Aruna[Shah.Aruna@epa.gov]; Tao, Jenny[Tao.Jenny@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Miller, David[Miller.DavidJ@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]
Cc: Kidwell, Jessica[kidwell.jessica@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]
From: Dunbar, Anwar
Sent: Tue 5/26/2015 1:54:45 PM
Subject: RE: Glyphosate CARC Meeting

That looks fine for me.

Anwar Y. Dunbar, Ph.D., Pharmacologist

Risk Assessment Branch 1

The Human Health Effects Division/ The Office of Pesticide Programs

1200 Pennsylvania Ave, NW

Washington, DC 20460

"Except for in the most unique of circumstances, mastery of any cognitively complex skill or task requires roughly 10,000 hours of practice"- Malcolm Gladwell, Author of the book Outliers

From: Brunsman, Lori
Sent: Tuesday, May 26, 2015 9:25 AM
To: OPP HED CARC; Christensen, Carol; Sarkar, Bayazid; Shah, Aruna; Tao, Jenny; Schlosser, Christopher; Miller, David; Lobdell, Danelle; Wood, Charles
Cc: Kidwell, Jessica; Kent, Ray; Liccione, John; Middleton, Karlyn; Rowland, Jess; McCarroll, Nancy; Akerman, Gregory; Smith, Charles; Dunbar, Anwar; Shah, Pv
Subject: Glyphosate CARC Meeting

We are considering moving the CARC meeting on Glyphosate from June 24th to July 8th. Please let me know ASAP if you CANNOT make the July 8th meeting date.

Thanks!

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunzman.lori@epa.gov

703-308-2902

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; OPP HED CARC[OPP_HED_CARC@epa.gov]; Christensen, Carol[Christensen.Carol@epa.gov]; Sarkar, Bayazid[Sarkar.Bayazid@epa.gov]; Shah, Aruna[Shah.Aruna@epa.gov]; Tao, Jenny[Tao.Jenny@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Miller, David[Miller.DavidJ@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]
Cc: Kidwell, Jessica[kidwell.jessica@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]
From: Liccione, John
Sent: Tue 5/26/2015 1:52:30 PM
Subject: RE: Glyphosate CARC Meeting

July 8th works good for me too....unless a grizzly bear or bison gets me in yellowstone in june. Had some close calls before.

From: Brunsman, Lori
Sent: Tuesday, May 26, 2015 9:25 AM
To: OPP HED CARC; Christensen, Carol; Sarkar, Bayazid; Shah, Aruna; Tao, Jenny; Schlosser, Christopher; Miller, David; Lobdell, Danelle; Wood, Charles
Cc: Kidwell, Jessica; Kent, Ray; Liccione, John; Middleton, Karlyn; Rowland, Jess; McCarroll, Nancy; Akerman, Gregory; Smith, Charles; Dunbar, Anwar; Shah, Pv
Subject: Glyphosate CARC Meeting

We are considering moving the CARC meeting on Glyphosate from June 24th to July 8th. Please let me know ASAP if you CANNOT make the July 8th meeting date.

Thanks!

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

*Environmental Protection Agency
One Potomac Yard S-10934*

*brunsman.lori@epa.gov
703-308-2902*

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; OPP HED CARC[OPP_HED_CARC@epa.gov]; Christensen, Carol[Christensen.Carol@epa.gov]; Sarkar, Bayazid[Sarkar.Bayazid@epa.gov]; Shah, Aruna[Shah.Aruna@epa.gov]; Tao, Jenny[Tao.Jenny@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Miller, David[Miller.DavidJ@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]
Cc: Kidwell, Jessica[kidwell.jessica@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]
From: Middleton, Karlyn
Sent: Tue 5/26/2015 1:42:44 PM
Subject: RE: Glyphosate CARC Meeting

The 8th is good for me.

From: Brunsman, Lori
Sent: Tuesday, May 26, 2015 9:25 AM
To: OPP HED CARC; Christensen, Carol; Sarkar, Bayazid; Shah, Aruna; Tao, Jenny; Schlosser, Christopher; Miller, David; Lobdell, Danelle; Wood, Charles
Cc: Kidwell, Jessica; Kent, Ray; Liccione, John; Middleton, Karlyn; Rowland, Jess; McCarroll, Nancy; Akerman, Gregory; Smith, Charles; Dunbar, Anwar; Shah, Pv
Subject: Glyphosate CARC Meeting

We are considering moving the CARC meeting on Glyphosate from June 24th to July 8th. Please let me know ASAP if you CANNOT make the July 8th meeting date.

Thanks!

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

*Environmental Protection Agency
One Potomac Yard S-10934*

*brunsman.lori@epa.gov
703-308-2902*

To: OPP HED CARC[OPP_HED_CARC@epa.gov]; Christensen, Carol[Christensen.Carol@epa.gov]; Sarkar, Bayazid[Sarkar.Bayazid@epa.gov]; Shah, Aruna[Shah.Aruna@epa.gov]; Tao, Jenny[Tao.Jenny@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Miller, David[Miller.DavidJ@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]
Cc: Kidwell, Jessica[kidwell.jessica@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]
From: Brunsman, Lori
Sent: Tue 5/26/2015 1:25:29 PM
Subject: Glyphosate CARC Meeting

We are considering moving the CARC meeting on Glyphosate from June 24th to July 8th. Please let me know ASAP if you CANNOT make the July 8th meeting date.

Thanks!

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

From: Wood, Charles
Location: DCRoomPYS10100/Potomac-Yard-One
Importance: Normal
Subject: Accepted: Glyphosate CARC Meeting
Start Date/Time: Wed 7/8/2015 2:30:00 PM
End Date/Time: Wed 7/8/2015 4:30:00 PM

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]
Cc: Rowland, Jess[Rowland.Jess@epa.gov]
From: Wood, Charles
Sent: Tue 5/26/2015 1:59:16 PM
Subject: RE: Glyphosate CARC Meeting

Hi Lori,

I will be traveling on Jul 8th and would likely miss a CARC meeting on that day.

--Charles

From: Brunsman, Lori
Sent: Tuesday, May 26, 2015 9:25 AM
To: OPP HED CARC; Christensen, Carol; Sarkar, Bayazid; Shah, Aruna; Tao, Jenny; Schlosser, Christopher; Miller, David; Lobdell, Danelle; Wood, Charles
Cc: Kidwell, Jessica; Kent, Ray; Liccione, John; Middleton, Karlyn; Rowland, Jess; McCarroll, Nancy; Akerman, Gregory; Smith, Charles; Dunbar, Anwar; Shah, Pv
Subject: Glyphosate CARC Meeting

We are considering moving the CARC meeting on Glyphosate from June 24th to July 8th. Please let me know ASAP if you CANNOT make the July 8th meeting date.

Thanks!

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

From: Wood, Charles
Location: DCRoomPYS10100/Potomac-Yard-One
Importance: Normal
Subject: Accepted: Glyphosate CARC Meeting
Start Date/Time: Wed 6/24/2015 2:30:00 PM
End Date/Time: Wed 6/24/2015 4:30:00 PM

From: Rowland, Jess

Required Attendees: akerman.gregory@epa.gov; Lori Brunsman; Chen, Jonathan; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Shah, Pv; Kent, Ray; Lobdell, Danelle; Woo, Yintak; Wood, Charles; Morton, Thurston

Location: 10621

Importance: Normal

Subject: Glyphosate - CARC - Continues.....

Start Date/Time: Wed 9/16/2015 5:00:00 PM

End Date/Time: Wed 9/16/2015 8:00:00 PM

Given the volume of data we have to review, I have scheduled this PM session.

This CARC should be a priority for you. So keep this day OPEN

Please adjust your other commitments for the day

From: Rowland, Jess

Required Attendees: akerman.gregory@epa.gov; Lori Brunsman; Chen, Jonathan; Kent, Ray; Kidwell, Jessica; Liccione, John; Lobdell, Danelle; Middleton, Karlyn; Shah, Pv; Woo, Yintak; Wood, Charles; Morton, Thurston; Smith, Charles; McCarroll, Nancy; Dunbar, Anwar

Location: 10100

Importance: Normal

Subject: Glyphosate - CARC

Start Date/Time: Wed 9/16/2015 1:00:00 PM

End Date/Time: Wed 9/16/2015 4:00:00 PM

Greg et al.,

Please note the earlier start time

Make necessary changes to your schedule to accommodate this meeting.

You will receive the CARC package on September 2nd.

Thanks

JR

To: Kent, Ray[Kent.Ray@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/23/2015 4:13:39 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Ray –

Try again. I just logged out of the document.

So can only one person edit it at a time? Maybe that's why people are having trouble saving the file; maybe more than one person was accessing it at the same time.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kent, Ray
Sent: Wednesday, September 23, 2015 12:00 PM
To: Brunsman, Lori; Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle;

Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I'm in the office and I can't edit the file. It says "locked for editing by Lori Brunsman"...

From: Brunsman, Lori

Sent: Wednesday, September 23, 2015 11:48 AM

To: Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunsman.lori@epa.gov

703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:48 AM

To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan;

Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open Glyphosate CARC Final 9.21.15 cpr JMK.docx

Followthis document to get updates in your newsfeed.

To: Kidwell, Jessica[kidwell.jessica@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Brunzman, Lori
Sent: Wed 9/23/2015 3:50:02 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

No green circle here, either.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
*Science Information Management Branch
Health Effects Division
Office of Pesticide Programs*

Office of Chemical Safety and Pollution Prevention

*Environmental Protection Agency
One Potomac Yard S-10934*

*brunzman.lori@epa.gov
703-308-2902*

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Brunzman, Lori; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

You get the green circle when you save it?

From: Brunzman, Lori

Sent: Wednesday, September 23, 2015 11:48 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

It works for me here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunsman.lori@epa.gov

703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:46 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

**Open Glyphosate CARC Final
9.21.15_cpr_JMK.docx**

Followthis document to get updates in your newsfeed.

To: Kidwell, Jessica[kidwell.jessica@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/23/2015 3:48:27 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open Glyphosate CARC Final 9.21.15_cpr_JMK.docx

Followthis document to get updates in your newsfeed.

To: Kidwell, Jessica[kidwell.jessica@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/23/2015 3:47:36 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

It works for me here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

**Open Glyphosate CARC Final
9.21.15_cpr_JMK.docx**

Followthis document to get updates in your newsfeed.

To: Chen, Jonathan[Chen.Jonathan@epa.gov]
From: Brunzman, Lori
Sent: Wed 9/16/2015 11:07:31 AM
Subject: RE: Glyphosate CARC Package

You're welcome!

Just 6 more emails with attachments headed your way this morning!

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunzman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Chen, Jonathan
Sent: Tuesday, September 15, 2015 3:45 PM
To: Brunzman, Lori
Subject: RE: Glyphosate CARC Package

Thank you.

Jonathan Chen

From: Brunsman, Lori
Sent: Tuesday, September 15, 2015 3:04 PM
To: Chen, Jonathan
Subject: RE: Glyphosate CARC Package

Jonathan –

There are a TON of documents. I will at least get the CARC package to you this afternoon and the rest of the documents to you tomorrow morning before the meeting.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

“When you have more than you need, build a longer table, not a higher fence.”

From: Chen, Jonathan
Sent: Tuesday, September 15, 2015 2:55 PM
To: Brunsman, Lori
Subject: FW: Glyphosate CARC Package

Dear Lori:

Can you send me the documents? I cannot access the CARC packages from Lotus Note.

Jonathan Chen

From: Brunsman, Lori

Sent: Wednesday, September 09, 2015 1:58 PM

To: Akerman, Gregory; Brunsman, Lori; Chen, Jonathan; Dunbar, Anwar; Kent, Ray; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Middleton, Karlyn; OPP HED Notes Coordinators; Rowland, Jess; Shah, Pv; Woo, Yintak; Wood, Charles; Lobdell, Danelle; Morton, Thurston; Smith, Charles

Subject: Glyphosate CARC Package

The Glyphosate CARC package is now on the Lotus Notes database.

Please let me know if you cannot access it and I will email you the documents.

REMINDER: the Glyphosate CARC meeting is an **ALL-DAY** meeting (9:00 am to 4:00 pm) next **Wednesday, September 16, 2015**, in room S-10100.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

*Environmental Protection Agency
One Potomac Yard S-10934*

*brunsman.lori@epa.gov
703-308-2902*

"When you have more than you need, build a longer table, not a higher fence."

To: Chen, Jonathan[Chen.Jonathan@epa.gov]
From: Brunzman, Lori
Sent: Tue 9/15/2015 7:04:28 PM
Subject: RE: Glyphosate CARC Package

Jonathan –

There are a TON of documents. I will at least get the CARC package to you this afternoon and the rest of the documents to you tomorrow morning before the meeting.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunzman.lori@epa.gov
703-308-2902

“When you have more than you need, build a longer table, not a higher fence.”

From: Chen, Jonathan
Sent: Tuesday, September 15, 2015 2:55 PM
To: Brunzman, Lori
Subject: FW: Glyphosate CARC Package

Dear Lori:

Can you send me the documents? I cannot access the CARC packages from Lotus Note.

Jonathan Chen

From: Brunsman, Lori

Sent: Wednesday, September 09, 2015 1:58 PM

To: Akerman, Gregory; Brunsman, Lori; Chen, Jonathan; Dunbar, Anwar; Kent, Ray; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Middleton, Karlyn; OPP HED Notes Coordinators; Rowland, Jess; Shah, Pv; Woo, Yintak; Wood, Charles; Lobdell, Danelle; Morton, Thurston; Smith, Charles

Subject: Glyphosate CARC Package

The Glyphosate CARC package is now on the Lotus Notes database.

Please let me know if you cannot access it and I will email you the documents.

REMINDER: the Glyphosate CARC meeting is an **ALL-DAY** meeting (9:00 am to 4:00 pm) next **Wednesday, September 16, 2015**, in room S-10100.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunsman.lori@epa.gov

703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

To: Kidwell, Jessica[kidwell.jessica@epa.gov]
From: Brunsman, Lori
Sent: Tue 9/15/2015 11:44:32 AM
Subject: RE: Glyphosate CARC Package

Sorry!

I switched my compressed day to yesterday so I could go on a field trip to Terrapin Adventures in Savage, MD, with Nory's class.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Monday, September 14, 2015 8:06 AM
To: Brunsman, Lori
Subject: RE: Glyphosate CARC Package

Hi Lori: Can you email me the documents? I can't get into LN from home for some reason.

Thanks, Jessica

From: Brunzman, Lori

Sent: Wednesday, September 09, 2015 1:58 PM

To: Akerman, Gregory; Brunzman, Lori; Chen, Jonathan; Dunbar, Anwar; Kent, Ray; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Middleton, Karlyn; OPP HED Notes Coordinators; Rowland, Jess; Shah, Pv; Woo, Yintak; Wood, Charles; Lobdell, Danelle; Morton, Thurston; Smith, Charles

Subject: Glyphosate CARC Package

The Glyphosate CARC package is now on the Lotus Notes database.

Please let me know if you cannot access it and I will email you the documents.

REMINDER: the Glyphosate CARC meeting is an **ALL-DAY** meeting (9:00 am to 4:00 pm) next **Wednesday, September 16, 2015**, in room S-10100.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunzman.lori@epa.gov

703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

To: Wood, Charles[Wood.Charles@epa.gov]
From: Brunzman, Lori
Sent: Thur 9/10/2015 1:11:07 PM
Subject: RE: Glyphosate DERs and Support Docs: Part 1 of 2

You're welcome! There should have been a total of 15 emails.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunzman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Wood, Charles
Sent: Thursday, September 10, 2015 9:09 AM
To: Brunzman, Lori
Subject: RE: Glyphosate DERs and Support Docs: Part 1 of 2

Thanks, Lori. Sorry for the trouble!

--Charles

From: Brunzman, Lori
Sent: Thursday, September 10, 2015 8:26 AM
To: Wood, Charles
Subject: Glyphosate DERs and Support Docs: Part 1 of 2

Charles –

There are a LOT of documents in the Glyphosate CARC package. I will send them to you in multiple emails.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunzman.lori@epa.gov
703-308-2902

“When you have more than you need, build a longer table, not a higher fence.”

From: Wood, Charles
Sent: Wednesday, September 09, 2015 3:08 PM
To: Brunzman, Lori
Subject: RE: Glyphosate CARC Package

Hi Lori,

Can you email me the package?

--Charles

From: Brunzman, Lori

Sent: Wednesday, September 09, 2015 1:58 PM

To: Akerman, Gregory; Brunzman, Lori; Chen, Jonathan; Dunbar, Anwar; Kent, Ray; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Middleton, Karlyn; OPP HED Notes Coordinators; Rowland, Jess; Shah, Pv; Woo, Yintak; Wood, Charles; Lobdell, Danelle; Morton, Thurston; Smith, Charles

Subject: Glyphosate CARC Package

The Glyphosate CARC package is now on the Lotus Notes database.

Please let me know if you cannot access it and I will email you the documents.

REMINDER: the Glyphosate CARC meeting is an **ALL-DAY** meeting (9:00 am to 4:00 pm) next **Wednesday, September 16, 2015**, in room S-10100.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunzman.lori@epa.gov

703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; OPP HED Notes Coordinators[OPP_HED_Notes_Coordinators@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]; Woo, Yintak[Woo.Yintak@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Morton, Thurston[Morton.Thurston@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/9/2015 5:58:01 PM
Subject: Glyphosate CARC Package

The Glyphosate CARC package is now on the Lotus Notes database.

Please let me know if you cannot access it and I will email you the documents.

REMINDER: the Glyphosate CARC meeting is an **ALL-DAY** meeting (9:00 am to 4:00 pm) next **Wednesday, September 16, 2015**, in room S-10100.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

To: Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Jess Rowland[Rowland.Jess@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/9/2015 11:31:07 AM
Subject: reschedule Glyphosate CARC?

The Glyphosate meeting is currently scheduled for one week from today, September 16th. The CARC package was due out September 2nd. When the package is this late, we typically reschedule the meeting. Do you want me to reschedule Glyphosate? What day do you think we'll get the package?

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Brunsman, Lori
Optional Attendees: Shah, Pv; Rowland, Jess
Location: DCRoomPYS10100/Potomac-Yard-One
Importance: Normal
Subject: Glyphosate CARC Meeting
Start Date/Time: Wed 9/16/2015 2:30:00 PM
End Date/Time: Wed 9/16/2015 4:30:00 PM

From: Brunsman, Lori
Required Attendees: Jess Rowland
Location: DCRoomPYS10100/Potomac-Yard-One
Importance: Normal
Subject: Glyphosate CARC Meeting
Start Date/Time: Wed 9/16/2015 4:30:00 PM
End Date/Time: Wed 9/16/2015 8:30:00 PM

From: Brunsman, Lori
Location: DCRoomPYS10100/Potomac-Yard-One
Importance: Normal
Subject: Glyphosate CARC Meeting
Start Date/Time: Wed 9/16/2015 1:30:00 PM
End Date/Time: Wed 9/16/2015 2:30:00 PM

To: Davis, Donna[Davis.Donna@epa.gov]
From: Brunzman, Lori
Sent: Wed 8/26/2015 11:07:19 AM
Subject: RE: CARC needs S-10100 on 9/16/15 all day

Donna –

Thank you for releasing the room reservation for S-10100 on 9/16/15. However, you released the 9:30-10:30 time slot, but not the 8:30-9:30 time slot. The Glyphosate CARC meeting starts at 9:00. If you could please release that earlier room reservation, too, I'd appreciate it.

Thanks!

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunzman.lori@epa.gov
703-308-2902

From: Davis, Donna
Sent: Tuesday, August 25, 2015 1:52 PM
To: Brunzman, Lori; Keller, Nancy
Cc: Wilbur, Donald; VanAlstine, Julie; Morton, Thurston; Rowland, Jess
Subject: RE: CARC needs S-10100 on 9/16/15 all day

Lori,

We were planning to meet and were doing a big training session in the room. Sounds like Jess is going to trump us. I will tell the co-chairs that we have been displaced. We may have to delay our training.

Donna

From: Brunsman, Lori
Sent: Tuesday, August 25, 2015 8:44 AM
To: Davis, Donna; Keller, Nancy
Subject: CARC needs S-10100 on 9/16/15 all day

Donna and Nancy –

We are having a marathon CARC meeting on Glyphosate all day (9:00 am – 4:00 pm) on Wednesday, September 16. I see that you have room S-10100 reserved for part of that day. Are you still having meetings on that day and, if so, would it be possible for you to move your meetings to another meeting room on that day?

Thanks!

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov

703-308-2902

To: Davis, Donna[Davis.Donna@epa.gov]
From: Brunsman, Lori
Sent: Tue 8/25/2015 6:03:59 PM
Subject: RE: CARC needs S-10100 on 9/16/15 all day

I'm sorry, Donna, but I think Jess is going trump you and take the room for the CARC, even though you have training scheduled. He actually has already set-up the Glyphosate CARC meeting that day from 9:00 am to 4:00 pm, but just today I reminded him that technically the CARC only has the room from 10:30 – 12:30.

If you could release the room reservation on the 16th, I'd appreciate it.

Sorry!

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

From: Davis, Donna
Sent: Tuesday, August 25, 2015 1:52 PM
To: Brunsman, Lori; Keller, Nancy
Cc: Wilbur, Donald; VanAlstine, Julie; Morton, Thurston; Rowland, Jess
Subject: RE: CARC needs S-10100 on 9/16/15 all day

Lori,

We were planning to meet and were doing a big training session in the room. Sounds like Jess is going to trump us. I will tell the co-chairs that we have been displaced. We may have to delay our training.

Donna

From: Brunsman, Lori
Sent: Tuesday, August 25, 2015 8:44 AM
To: Davis, Donna; Keller, Nancy
Subject: CARC needs S-10100 on 9/16/15 all day

Donna and Nancy –

We are having a marathon CARC meeting on Glyphosate all day (9:00 am – 4:00 pm) on Wednesday, September 16. I see that you have room S-10100 reserved for part of that day. Are you still having meetings on that day and, if so, would it be possible for you to move your meetings to another meeting room on that day?

Thanks!

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

From: Brunsman, Lori
Location: 10621
Importance: Normal
Subject: Accepted: Glyphosate - CARC - Continues.....
Start Date/Time: Wed 9/16/2015 5:00:00 PM
End Date/Time: Wed 9/16/2015 8:00:00 PM

To: Lobdell, Danelle[Lobdell.Danelle@epa.gov]
From: Brunzman, Lori
Sent: Wed 6/17/2015 5:18:33 PM
Subject: RE: Glyphosate CARC Meeting

Danelle –

The CARC meeting on Glyphosate has been cancelled. No CARC meeting will be held.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunzman.lori@epa.gov
703-308-2902

From: Lobdell, Danelle
Sent: Wednesday, June 10, 2015 4:31 PM
To: Brunzman, Lori
Subject: RE: Glyphosate CARC Meeting

Hi Lori,

Can you send a new updated invite for this meeting? You deleted the previous invite (which did update for July 8th) and it is now off of my calendar.

Thank you,

Danelle

Danelle T. Lobdell, Ph.D., M.S.

Epidemiologist

National Health and Environmental Effects Research Laboratory

Environmental Public Health Division

Mail:

USEPA

MD 58A

Research Triangle Park, NC 27711

Package Delivery:

USEPA Human Studies Facility

104 Mason Farm Rd, Room 52

Chapel Hill, NC 27514-4512

Phone: 919-843-4434 Fax: 919-966-7584

From: Brunsman, Lori

Sent: Tuesday, May 26, 2015 9:25 AM

To: OPP HED CARC; Christensen, Carol; Sarkar, Bayazid; Shah, Aruna; Tao, Jenny; Schlosser, Christopher; Miller, David; Lobdell, Danelle; Wood, Charles

Cc: Kidwell, Jessica; Kent, Ray; Liccione, John; Middleton, Karlyn; Rowland, Jess; McCarroll, Nancy; Akerman, Gregory; Smith, Charles; Dunbar, Anwar; Shah, Pv

Subject: Glyphosate CARC Meeting

We are considering moving the CARC meeting on Glyphosate from June 24th to July 8th. Please let me know ASAP if you CANNOT make the July 8th meeting date.

Thanks!

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunzman.lori@epa.gov

703-308-2902

To: Kidwell, Jessica[kidwell.jessica@epa.gov]
From: Akerman, Gregory
Sent: Thur 9/24/2015 12:03:25 PM
Subject: FW: Glyphosate CARC Report

Uh okay John.... Not really relevant today, but thanks. Lol (no, I didn't send that to him, but I was tempted).

From: Liccione, John
Sent: Thursday, September 24, 2015 7:49 AM
To: Middleton, Karlyn; Rowland, Jess
Cc: Brunzman, Lori; Dunbar, Anwar; Kidwell, Jessica; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher; Akerman, Gregory
Subject: RE: Glyphosate CARC Report

It happened to me too.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:27 AM
To: Rowland, Jess
Cc: Brunzman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher; Akerman, Gregory
Subject: RE: Glyphosate CARC Report

Hi all,

For some reason, I can't upload my comments to share point. It says that its locked for editing for me. Did this happen to anyone else?

From: Rowland, Jess

Sent: Tuesday, September 22, 2015 2:01 PM

To: Akerman, Gregory; Brunzman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher

Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the “document makeover”

Concentrate on the science

Make this as your priority and your “home pope work” on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Rowland, Jess[Rowland.Jess@epa.gov]
From: Akerman, Gregory
Sent: Wed 9/23/2015 4:03:35 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe Jessica should just post the version that Cal formatted (he already sent it to her) and we can make edits using track changes as we normally do. I will help pull all the edits together tomorrow.

From: Rowland, Jess
Sent: Wednesday, September 23, 2015 11:51 AM
To: Brunzman, Lori; Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

At home it should be called share pointless ☐. Another crown • of OEI

Sent from my Windows Phone

From: Brunzman, Lori
Sent: 9/23/2015 11:48 AM
To: Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open Glyphosate CARC Final 9.21.15_cpr_JMK.docx

Followthis document to get updates in your newsfeed.

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]
From: Akerman, Gregory
Sent: Wed 9/9/2015 5:34:51 PM
Subject: glyphosate CARC meeting

Hi Lori Since (I think) you send out the meeting invites for the CARC meetings, would you remind the CARC members that there is an extended CARC meeting next Wed and that the meeting materials are on the CARC dbase?

Thanks,

Greg

From: Akerman, Gregory
Required Attendees: Rowland, Jess; Dunbar, Anwar; Middleton, Karlyn
Location: S-10621
Importance: Normal
Subject: CARC pre=meet for glyphosate
Start Date/Time: Thur 9/10/2015 12:00:00 PM
End Date/Time: Thur 9/10/2015 1:00:00 PM

Jess asked me to set up this meeting on this date and time to prep for the glyphosate CARC meeting.

From: Akerman, Gregory
Required Attendees: Rowland, Jess; Dunbar, Anwar; Middleton, Karlyn
Location: S-10621
Importance: Normal
Subject: CARC pre=meet for glyphosate
Start Date/Time: Thur 9/10/2015 1:00:00 PM
End Date/Time: Thur 9/10/2015 2:00:00 PM

Jess asked me to set up this meeting on this date and time to prep for the glyphosate CARC meeting.

From: Perron, Monique
Importance: Normal
Subject: Glyphosate CARC
Start Date/Time: Wed 9/16/2015 5:00:00 PM
End Date/Time: Wed 9/16/2015 8:00:00 PM

From: Perron, Monique
Importance: Normal
Subject: Glyphosate CARC
Start Date/Time: Wed 9/16/2015 1:00:00 PM
End Date/Time: Wed 9/16/2015 4:00:00 PM

To: Brunzman, Lori[Brunzman.Lori@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Kent, Ray
Sent: Wed 9/23/2015 3:59:40 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I'm in the office and I can't edit the file. It says "locked for editing by Lori Brunzman"...

From: Brunzman, Lori
Sent: Wednesday, September 23, 2015 11:48 AM
To: Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunzman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open Glyphosate CARC Final
9.21.15 cpr JMK.docx

Followthis document to get updates in your newsfeed.

To: Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]
Cc: Brunsman, Lori[Brunsmann.Lori@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]
From: Liccione, John
Sent: Thur 9/24/2015 11:49:26 AM
Subject: RE: Glyphosate CARC Report

It happened to me too.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:27 AM
To: Rowland, Jess
Cc: Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher; Akerman, Gregory
Subject: RE: Glyphosate CARC Report

Hi all,

For some reason, I can't upload my comments to share point. It says that its locked for editing for me. Did this happen to anyone else?

From: Rowland, Jess
Sent: Tuesday, September 22, 2015 2:01 PM
To: Akerman, Gregory; Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher
Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the “document makeover”

Concentrate on the science

Make this as your priority and your “home pope work” on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Rowland, Jess[Rowland.Jess@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; May, Brenda[May.Brenda@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Powell, Calvin[Powell.Calvin@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/23/2015 4:24:24 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I just posted CPR's version to the CARC Discussion database.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Rowland, Jess
Sent: Wednesday, September 23, 2015 12:18 PM
To: Akerman, Gregory; Brunsman, Lori; Kent, Ray; McCarroll, Nancy; Middleton, Karlyn; May, Brenda; Dunbar, Anwar; Akerman, Gregory; Powell, Calvin
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Ok. This is turning into a CF.
Lori u have rights to CARC discussion db.
Please post CPRs version.
Every one make your edits in track changes. I am in Friday. I will collate and revise the documents.
Lori if you don't have rights, Jessica you post it

Sent from my Windows Phone

From: Akerman, Gregory

Sent: 9/23/2015 12:03 PM

To: Rowland, Jess

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe Jessica should just post the version that Cal formatted (he already sent it to her) and we can make edits using track changes as we normally do. I will help pull all the edits together tomorrow.

From: Rowland, Jess

Sent: Wednesday, September 23, 2015 11:51 AM

To: Brunzman, Lori; Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

At home it should be called share pointless ☐. Another crown • of OEI

Sent from my Windows Phone

From: Brunzman, Lori

Sent: 9/23/2015 11:48 AM

To: Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

*Environmental Protection Agency
One Potomac Yard S-10934*

*brunsman.lori@epa.gov
703-308-2902*

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:48 AM
To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

**Open Glyphosate CARC Final
9.21.15_cpr_JMK.docx**

Followthis document to get updates in your newsfeed.

To: Kent, Ray[Kent.Ray@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/23/2015 4:13:39 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Ray –

Try again. I just logged out of the document.

So can only one person edit it at a time? Maybe that's why people are having trouble saving the file; maybe more than one person was accessing it at the same time.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kent, Ray
Sent: Wednesday, September 23, 2015 12:00 PM
To: Brunsman, Lori; Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle;

Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I'm in the office and I can't edit the file. It says "locked for editing by Lori Brunsman"...

From: Brunsman, Lori

Sent: Wednesday, September 23, 2015 11:48 AM

To: Kidwell, Jessica; Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

I think the problem must have to do with accessing Sharepoint from home. It works fine here at the office.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunsman.lori@epa.gov

703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:48 AM

To: Middleton, Karlyn; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan;

Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Maybe there's some code in there preventing us from editing. I don't know.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:47 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Not working.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:46 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:43 AM
To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Cc: Kidwell, Jessica
Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open Glyphosate CARC Final 9.21.15 cpr JMK.docx

Followthis document to get updates in your newsfeed.

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]
From: Kidwell, Jessica
Sent: Wed 9/23/2015 3:50:34 PM
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Then it's not working there either.

From: Brunsman, Lori
Sent: Wednesday, September 23, 2015 11:50 AM
To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy
Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

No green circle here, either.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:48 AM

To: Brunzman, Lori; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

You get the green circle when you save it?

From: Brunzman, Lori

Sent: Wednesday, September 23, 2015 11:48 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

It works for me here at the office.

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer

Science Information Management Branch

Health Effects Division

Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency

One Potomac Yard S-10934

brunzman.lori@epa.gov

703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:46 AM

To: Kidwell, Jessica; Akerman, Gregory; Lobdell, Danelle; Brunzman, Lori; Chen, Jonathan;

Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Subject: RE: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

This still doesn't work for me. Does it work for anyone else? If it's not working I'm going to take it down. Please let me know.

From: Kidwell, Jessica

Sent: Wednesday, September 23, 2015 11:43 AM

To: Akerman, Gregory; Lobdell, Danelle; Brunsman, Lori; Chen, Jonathan; Liccione, John; Wood, Charles; Middleton, Karlyn; Dunbar, Anwar; Rowland, Jess; Kent, Ray; McCarroll, Nancy

Cc: Kidwell, Jessica

Subject: Kidwell, Jessica has shared 'Glyphosate CARC Final 9.21.15_cpr_JMK'

Let's see if we're able to edit this version. This is Jess's file which has Cal's formatting edits. Please share this with anyone I missed on CARC.

Open **Glyphosate CARC Final**
9.21.15_cpr_JMK.docx

Followthis document to get updates in your newsfeed.

To: Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]
From: Kidwell, Jessica
Sent: Wed 9/23/2015 3:37:06 PM
Subject: RE: Glyphosate CARC tReport

Yes, it could get very complicated. I'll share it with the carc.

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:36 AM
To: Kidwell, Jessica; Rowland, Jess
Subject: RE: Glyphosate CARC tReport

I think that would be good. Otherwise, we will have a lot of different versions.

From: Kidwell, Jessica
Sent: Wednesday, September 23, 2015 11:30 AM
To: Middleton, Karlyn; Rowland, Jess
Cc: Brunsman, Lori; Dunbar, Anwar; Liccione, John; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher; Akerman, Gregory
Subject: RE: Glyphosate CARC tReport

Yes, Greg and I can't either. I'm actually using Cal's version since he made formatting edits instead of the file on the share drive that Lori's referring to. Do you want me to share this file?

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:27 AM
To: Rowland, Jess
Cc: Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher; Akerman, Gregory
Subject: RE: Glyphosate CARC Report

Hi all,

For some reason, I can't upload my comments to share point. It says that its locked for editing for me. Did this happen to anyone else?

From: Rowland, Jess

Sent: Tuesday, September 22, 2015 2:01 PM

To: Akerman, Gregory; Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher

Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the "document makeover"

Concentrate on the science

Make this as your priority and your "home pope work" on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]
Cc: Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/23/2015 3:28:34 PM
Subject: RE: Glyphosate CARC Report

I know both Jessica and Greg were having problems accessing the Sharepoint site, too. I downloaded the document and sent it to them via email.

Have a great day!

Lori

*Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs*

Office of Chemical Safety and Pollution Prevention

*Environmental Protection Agency
One Potomac Yard S-10934*

*brunsman.lori@epa.gov
703-308-2902*

"When you have more than you need, build a longer table, not a higher fence."

From: Middleton, Karlyn
Sent: Wednesday, September 23, 2015 11:27 AM
To: Rowland, Jess
Cc: Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher; Akerman, Gregory
Subject: RE: Glyphosate CARC Report

Hi all,

For some reason, I can't upload my comments to share point. It says that its locked for editing for me. Did this happen to anyone else?

From: Rowland, Jess

Sent: Tuesday, September 22, 2015 2:01 PM

To: Akerman, Gregory; Brunsman, Lori; Dunbar, Anwar; Kidwell, Jessica; Liccione, John; Middleton, Karlyn; McCarroll, Nancy; Chen, Jonathan; Kent, Ray; Schlosser, Christopher

Subject: Glyphosate CARC Report

Hi

Hope you all received the CARC draft thru sharepoint.

Please make the edits on sharepoint so I can see the comments

Do NOT waste time on format, paginations, tabs etc. CPR is do the "document makeover"

Concentrate on the science

Make this as your priority and your "home pope work" on Wednesday

I would like to have your comments not later than COB Thursday

Thank you for all your work on this CARC

Regards

JR

Jess Rowland,

Deputy Director
Health Effects Division
703-308-2719

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov];
Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Kent,
Ray[Kent.Ray@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll,
Nancy[McCarroll.Nancy@epa.gov]; May, Brenda[May.Brenda@epa.gov]; Middleton,
Karlyn[Middleton.Karlyn@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Schlosser,
Christopher[Schlosser.Christopher@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Woo,
Yintak[Woo.Yintak@epa.gov]
Cc: Rowland, Jess[Rowland.Jess@epa.gov]
From: Rowland, Jess
Sent: Tue 9/22/2015 5:43:19 PM
Subject: Rowland, Jess has shared 'Glyphosate CARC Final 9.21.15'

Here's the document that Rowland, Jess shared with you.

Open Glyphosate CARC Final 9.21.15.docx

Followthis document to get updates in your newsfeed.

To: Akerman, Gregory[Akerman.Gregory@epa.gov]; Brunsman, Lori[Brunsman.Lori@epa.gov]; Chen, Jonathan[Chen.Jonathan@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Kidwell, Jessica[kidwell.jessica@epa.gov]; Liccione, John[Liccione.John@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; OPP HED Notes Coordinators[OPP_HED_Notes_Coordinators@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]; Woo, Yintak[Woo.Yintak@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Morton, Thurston[Morton.Thurston@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]
From: Brunsman, Lori
Sent: Wed 9/9/2015 5:58:01 PM
Subject: Glyphosate CARC Package

The Glyphosate CARC package is now on the Lotus Notes database.

Please let me know if you cannot access it and I will email you the documents.

REMINDER: the Glyphosate CARC meeting is an **ALL-DAY** meeting (9:00 am to 4:00 pm) next **Wednesday, September 16, 2015**, in room S-10100.

Have a great day!

Lori

Lori Brunsman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunsman.lori@epa.gov
703-308-2902

"When you have more than you need, build a longer table, not a higher fence."

To: Middleton, Karlyn[Middleton.Karlyn@epa.gov]
From: Vogel, Dana
Sent: Wed 9/9/2015 3:15:32 PM
Subject: Re: pls add anna to glyphosate carc meeting

U rule!

Dana Vogel
Sent from my iPhone

On Sep 9, 2015, at 11:01 AM, Middleton, Karlyn <Middleton.Karlyn@epa.gov> wrote:

I sent her the invitation yesterday.

From: Vogel, Dana
Sent: Wednesday, September 09, 2015 11:01 AM
To: Middleton, Karlyn
Subject: pls add anna to glyphosate carc meeting

Thanks!!

Director, Health Effects Division

Office of Pesticide Programs

USEPA

To: Rowland, Jess[Rowland.Jess@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Swartz, Christina[Swartz.Christina@epa.gov]; Davis, Donna[Davis.Donna@epa.gov]; Morton, Thurston[Morton.Thurston@epa.gov]
Cc: Kidwell, Jessica[kidwell.jessica@epa.gov]
From: Kidwell, Jessica L
Sent: Wed 9/9/2015 1:55:07 PM
Subject: RE: Carc

Trust me, you want Jessica M. instead of Jessica L. on this one. I've copied her here.

Thanks, Jessica L.

From: Rowland, Jess
Sent: Wednesday, September 09, 2015 8:52 AM
To: Schlosser, Christopher; Kidwell, Jessica L; Middleton, Karlyn; Swartz, Christina; Davis, Donna; Morton, Thurston
Subject: Carc

Chris
I have asked Jessica to be Ex.Sec for the Glyphosate CARC.
JR

Sent from my Windows Phone

To: Mendez, Elizabeth[Mendez.Elizabeth@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]
From: Dunbar, Anwar
Sent: Wed 8/12/2015 10:14:55 PM
Subject: ToxSAC Meeting

Hello Liz and Karlyn. I talked it over with my branch chief, and I won't the meeting so that I work on the upcoming glyphosate CARC meeting and document.

Anwar Y. Dunbar, Ph.D., Pharmacologist

Risk Assessment Branch 1

The Human Health Effects Division/ The Office of Pesticide Programs

1200 Pennsylvania Ave, NW

Washington, DC 20460

"Except for in the most unique of circumstances, mastery of any cognitively complex skill or task requires roughly 10,000 hours of practice"- Malcolm Gladwell, Author of the book Outliers

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; OPP HED CARC[OPP_HED_CARC@epa.gov]; Christensen, Carol[Christensen.Carol@epa.gov]; Sarkar, Bayazid[Sarkar.Bayazid@epa.gov]; Shah, Aruna[Shah.Aruna@epa.gov]; Tao, Jenny[Tao.Jenny@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Miller, David[Miller.DavidJ@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]
Cc: Kidwell, Jessica[kidwell.jessica@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]
From: Shah, Pv
Sent: Tue 5/26/2015 3:29:14 PM
Subject: RE: Glyphosate CARC Meeting

ok

P. V. Shah, Ph.D
Chief, Chemistry, Inerts and Toxicology Assessment Branch (CITAB)
Registration Division
Office of Pesticides Programs, US EPA
1200 Pennsylvania Ave., NW
Washington, DC 20460 (USA)
Phone: 703-308-1846
Fax: 703-605-0781
Shah.Pv@epa.gov

For FED EX and UPS Deliveries: One Potomac Yard (South Building), 2777 Crystal Drive (Room S-7751), Arlington, VA 22202

From: Brunsman, Lori
Sent: Tuesday, May 26, 2015 9:25 AM
To: OPP HED CARC; Christensen, Carol; Sarkar, Bayazid; Shah, Aruna; Tao, Jenny; Schlosser, Christopher; Miller, David; Lobdell, Danelle; Wood, Charles
Cc: Kidwell, Jessica; Kent, Ray; Liccione, John; Middleton, Karlyn; Rowland, Jess; McCarroll, Nancy; Akerman, Gregory; Smith, Charles; Dunbar, Anwar; Shah, Pv
Subject: Glyphosate CARC Meeting

We are considering moving the CARC meeting on Glyphosate from June 24th to July 8th. Please let me know ASAP if you CANNOT make the July 8th meeting date.

Thanks!

Have a great day!

Lori

Lori Brunzman, Statistician and Project Officer
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs

Office of Chemical Safety and Pollution Prevention

Environmental Protection Agency
One Potomac Yard S-10934

brunzman.lori@epa.gov
703-308-2902

To: Brunsman, Lori[Brunsmann.Lori@epa.gov]; OPP HED CARC[OPP_HED_CARC@epa.gov]; Christensen, Carol[Christensen.Carol@epa.gov]; Sarkar, Bayazid[Sarkar.Bayazid@epa.gov]; Shah, Aruna[Shah.Aruna@epa.gov]; Tao, Jenny[Tao.Jenny@epa.gov]; Schlosser, Christopher[Schlosser.Christopher@epa.gov]; Miller, David[Miller.DavidJ@epa.gov]; Lobdell, Danelle[Lobdell.Danelle@epa.gov]; Wood, Charles[Wood.Charles@epa.gov]
Cc: Kidwell, Jessica[kidwell.jessica@epa.gov]; Kent, Ray[Kent.Ray@epa.gov]; Liccione, John[Liccione.John@epa.gov]; Middleton, Karlyn[Middleton.Karlyn@epa.gov]; Rowland, Jess[Rowland.Jess@epa.gov]; McCarroll, Nancy[McCarroll.Nancy@epa.gov]; Akerman, Gregory[Akerman.Gregory@epa.gov]; Smith, Charles[Smith.Charles@epa.gov]; Dunbar, Anwar[Dunbar.Anwar@epa.gov]; Shah, Pv[Shah.Pv@epa.gov]
From: Chen, Jonathan
Sent: Tue 5/26/2015 1:55:50 PM
Subject: RE: Glyphosate CARC Meeting

July 8th is good for me.

Jonathan Chen

Jonathan Chen

From: Brunsman, Lori
Sent: Tuesday, May 26, 2015 9:25 AM
To: OPP HED CARC; Christensen, Carol; Sarkar, Bayazid; Shah, Aruna; Tao, Jenny; Schlosser, Christopher; Miller, David; Lobdell, Danelle; Wood, Charles
Cc: Kidwell, Jessica; Kent, Ray; Liccione, John; Middleton, Karlyn; Rowland, Jess; McCarroll, Nancy; Akerman, Gregory; Smith, Charles; Dunbar, Anwar; Shah, Pv
Subject: Glyphosate CARC Meeting

We are considering moving the CARC meeting on Glyphosate from June 24th to July 8th. Please let me know ASAP if you CANNOT make the July 8th meeting date.

Thanks!

Have a great day!

Lori
